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THE NEW INTERNATIONAL ENCYCLOPÆDIA

SECOND EDITION

VOLUME XX

NEW YORK
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1924

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KEY TO PRONUNCIATION

For a full explanation of the various sounds indicated, see the KEY TO PRONUNCIATION in Vol. I.

ā as in ale, fate.
ȧ " " senate, chaotic.
â " " glare, care, and as *e* in there
ă " " am, at.
ä " " arm, father.
å " " ant, and final *a* in America, armada, etc.
a " " final, regal, pleasant.
a̲ " " all, fall.
ē " " eve.
ė̄ " " elate, evade.
ĕ " " end, pet.
ẽ " " fern, her, and as *i* in sir, etc.
e " " agency, judgment.
ī " " ice, quiet.
i̇̄ " " quiescent.
ĭ " " ill, fit.
ō " " old, sober.
ȱ " " obey, sobriety.
ô " " orb, nor.
ŏ " " odd, forest, not.
o " " atom, carol.
oi " " oil, boil.
o͞o " " food, fool, and as *u* in rude, rule.
ou " " house, mouse.
u " " use, mule.
u̇̄ " " unite.
ŭ " " cut, but.
u̇ " " full, put, or as *oo* in foot, book.
û " " urn, burn.
y " " yet, yield.
B " " Spanish Habana, Córdoba, where it is like English *v* but made with the lips alone.

ch as in chair, cheese.
D " " Spanish Almodovar, pulgada, where it is nearly like *th* in English then.
g " " go, get.
G " " German Landtag = *ch* in Ger. ach, etc.
H " *j* in Spanish Jijona, *g* in Spanish gila; like English *h* in hue, but stronger.
hw " *wh* in which.
K " *ch* in German ich, Albrecht = *g* in German Arensberg, Mecklenburg, etc.
n̲ " in sinker, longer.
ng " " sing, long.
N " " French bon, Bourbon, and *m* in the French Étampes; here it indicates nasalizing of the preceding vowel.
sh " " shine, shut.
th " " thrust, thin.
TH " " then, this.
zh " *z* in azure, and *s* in pleasure.

An apostrophe ['] is sometimes used as in tā'b'l (table), kăz''m (chasm), to indicate the elision of a vowel or its reduction to a mere murmur.

For foreign sounds, the nearest English equivalent is generally used. In any case where a special symbol, as G, H, K, N, is used, those unfamiliar with the foreign sound indicated may substitute the English sound ordinarily indicated by the letter. For a full description of all such sounds, see the article on PRONUNCIATION.

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RUSSO–TURKISH WAR.
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SAINT PAUL.
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* Deceased.

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SHEEP.
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Dr. Edwin West Allen.
SHELLEY, P. B.
Professor George E. Woodberry.
Dr. Horatio Sheafe Krans.

* Deceased.

THE NEW INTERNATIONAL ENCYCLOPÆDIA

RIGGS, Elias (1810–1901). An American missionary and linguist. He was born at New Providence, N. J., and graduated at Amherst College in 1829 and at Andover Theological Seminary in 1832. The first six years of his missionary career were spent in Athens and Argos. In 1838 he was transferred to Smyrna and in 1853 to Constantinople, where he continued in the service of the American Board until his death. Between 1856 and 1858 he visited America and during this time superintended the publication of his Armenian Bible and taught in Union Seminary. He was a member of the committee appointed by the British and Foreign Bible Society and the American Bible Society to prepare a Turkish Bible in both Arabic and Armenian characters (finished, 1878). He published grammars of the Chaldee, Bulgarian, Modern Armenian, and Turkish languages; Modern Armenian and Bulgarian translations of the Scriptures; *A Harmony of the Gospels* (1880) and *A Bible Dictionary* (1884), both in Bulgarian.

RIGGS, Kate Douglas Wiggin. See Wiggin.

RIGGS, Stephen Return (1812–83). A missionary among the American Indians, born in Steubenville, Ohio. He was educated at the Ripley (Ohio) Latin School, Jefferson College, and the Western Theological Seminary at Allegheny, and in 1837 was commissioned missionary at Fort Snelling. During the early years of his work he found time to publish lesson books in Dakota and to prepare the manuscript for his *Grammar and Dictionary of the Dakota Language,* which was published by the Smithsonian Institution (1852). In 1883 his Dakota-English Dictionary was published by the Bureau of Ethnology. His best-known work is the form of writing and printing the Dakota language, still in general use among the various tribes.

RIGGS, William Henry (c.1838–). An American collector of arms and armor. He was born in New York, the son of Elisha Riggs, a widely known banker. His early interest was in Indian arms and costumes. While at school in Vevey, Switzerland, in 1854, he formed what proved to be a lifelong friendship with J. P. Morgan, Sr. (q.v.). When a student of mining engineering at the Technische Hochschule in Dresden, about 1856, he began collecting arms and armor of the Middle Ages and the Renaissance. After 1857 he maintained a permanent residence in Paris, where his house became the meeting place for some of the most notable people of the day. But much of his time was spent in collecting-tours through Italy, Germany, France, and Spain, and he lived for months together in some of the larger cities. Altogether he became the possessor of some 8000 pieces of arms and armor, but he kept only the choicest. In 1913, partly through the influence of Mr. Morgan, he decided to give his collection to the Metropolitan Museum of Art in New York. See Riggs Collection of Arms and Armor.

RIGGS COLLECTION OF ARMS AND ARMOR. A collection of mediæval and Renaissance arms and armor, one of the finest in the world, presented to the Metropolitan Museum of Art, New York, in 1913, by William H. Riggs (q.v.). It comprises 1847 catalogued objects and in all about 2500 separate pieces. Many of these are of great historic interest as well as of the highest artistic importance, for among the original owners were some of the great rulers and noble families of Europe. See Plate with article Arms and Armor. Consult Bashford Dean, in *Bulletin of the Metropolitan Museum,* vol. ix, no. 3 (New York, March, 1914), and id., *Handbook of Arms and Armor* (ib., 1915).

RIGG'S DISEASE. See Pyorrhœa Alveolaris.

RIGHI, rē'gē. A mountain of Switzerland. See Rigi.

RIGHI, Augusto (1850–1920). An Italian physicist. He was born in Bologna and was educated at the University of Bologna. After 1873 he was professor successively in the Technology Institute at Bologna, at the universities of Palermo and Padua, and, beginning in 1889, professor of experimental physics in the University of Bologna. His researches relative to the connection between the magnetization of bismuth and other substances and their conduction of heat and electricity are classical. Immediately after the discovery by Hertz of the physical methods for the investigation of electromagnetic waves, Righi took up this line of work and made many important advances. It was in the elaboration of certain methods devised by Righi and through simple changes in his apparatus that Marconi succeeded in making use commercially of electric waves in wireless telegraphy (q.v.). Righi became a Senator of the Kingdom and a fellow of the Ac-

cademia dei Lincei, Rome. He published: *Die Optik der elektrischen Schwingungen* (1898); *Modern Theory of Physical Phenomena: Radioactivity, Ions, Electrons* (1904); and more than 200 scientific articles and monographs.

RIGHT (AS. *riht*, Goth. *raihts*, OHG. *reht*, Ger. *recht*, right; connected with Lat. *rectus*, Av. *rašta*, right, straight, Skt. *rju*, right, and with Lat. *regere*, to direct, rule, Gk. *ὀρέγειν*, *oregein*, to stretch out), THE. In European politics, the name generally given to conservative parties in the national assembly. See POLITICAL PARTIES.

RIGHT, VESTED. See VESTED RIGHT.

RIGHT ASCENSION. See ASCENSION, RIGHT.

RIGHT OF ACCESS. See ACCESS, RIGHT OF.

RIGHT OF ASSEMBLY. See ASSEMBLY, RIGHT OF.

RIGHT OF ASYLUM. See ASYLUM, RIGHT OF.

RIGHT OF ENTRY. See ENTRY, RIGHT OF.

RIGHT OF REGALIA. See REGALIA, RIGHT OF.

RIGHT OF SURVIVORSHIP. See SURVIVORSHIP, RIGHT OF.

RIGHT OF WAY. See WAY.

RIGHTS, BILL OF. See RIGHTS, DECLARATION AND BILL OF.

RIGHTS, CIVIL. In the most general sense, rights secured to the individual by civil or municipal law. As thus employed the phrase is nearly identical with legal, as distinguished from moral or merely abstract, rights. It does not in a given case necessarily comprehend all the privileges of citizenship, still less the privileges which political philosophers may claim as incident to citizenship. Thus, the rights to life, to liberty, and to the pursuit of happiness, asserted in the American Declaration of Independence, are civil rights only in so far as they are defined and protected by the Constitution and laws of the United States. Further than that they are merely rhetorical and philosophical claims as to the rightful position of the individual in organized society.

The expression "civil rights" thus includes the rights which people have and which they are legally capable of enforcing against one another, as well as those rights which individuals may assert and defend against the state. It is sometimes employed in a more limited sense, as referring only to the latter class of rights, such as are asserted in the Declaration of Rights made by the Lords and Commons of England at Westminster in 1688 and presented to William of Orange and Mary, his wife, as the conditions of their accession to the throne, the Bill of Rights passed by the British Parliament in 1689, such provisions of law as are embodied in the first 10 amendments to the Federal Constitution of the United States, and corresponding or similar provisions in the constitutions of the several States. These provisions relate to the religious freedom of the citizen, to liberty of speech and of the press, to the right to assemble and petition for the redress of grievances, to the right to bear arms, to the protection of the individual against arbitrary arrest, to the guaranty of an orderly administration of justice, to the right of habeas corpus, and to security against arbitrary interference with property and the like.

In the United States the phrase "civil rights" is employed in a specific sense to denote the rights intended to be secured by the fourteenth and fifteenth amendments to the Federal Constitution, adopted in 1868 and 1870 respectively, and by certain acts of Congress and of the Legislatures of the several States to the same effect. These constitutional and statutory provisions were a part of the reconstruction policy of the government and were intended to secure the recently emancipated slaves in their freedom and in the exercise of the rights of citizenship which had been conferred upon them. The more important provisions of the two amendments referred to are: (1) those forbidding the States to make or enforce any law which shall abridge the privileges or immunities of citizens of the United States, or to deprive any person of life, liberty, or property without due process of law, or to deny to any person the equal protection of the laws; (2) that providing for the reduction of the representation of a State in Congress in proportion to the number of its male citizens over 21 years of age who are denied the right of suffrage; and (3) that which declares that the right of the citizens of the United States to vote shall not be abridged by the United States or by any State on account of race, color, or previous condition of servitude.

It is generally conceded that these provisions of the Constitution have failed of their object and that they have done little to secure to the negro in America the civil rights to which they refer. As to the second provision above enumerated, no effort has been made by the national government to enforce it. The third provision has been generally evaded in the Southern States, and in some of them the negro has been effectually excluded from the suffrage by constitutional and statutory provisions prescribing strict educational or property qualifications for the exercise of the right to vote.

The first provision, which aims to secure to all citizens equality of rights and privileges, though not as completely futile as the others to which reference has been made, has had a very limited effect. Being by its terms restricted to the acts of States, it does not extend to the acts of individuals, unless they are State officials in the performance of their public duties. Thus, the power of Congress to pass legislation for the enforcement of the provision is limited to action which is corrective of State legislation. The citizen is still dependent upon State law for his protection against individuals who threaten his life, liberty, or property or who discriminate against him on account of his race. Then, too, the operation of the provision has been more restricted by judicial construction, as in the decision that a statute forbidding the intermarriage of whites and blacks was not within the condemnation of the Constitution, as the amendment in question was designed to secure rights of a civil and political nature only and not social or domestic rights. It has also been held that the amendment does not add to the privileges and immunities of citizens, but only protects those which they already have. Thus, it does not extend the franchise nor the right to serve on juries to negroes or to women who do not already possess it.

These illustrations show that the civil-rights legislation of the nation at large has been of little effect. The more immediate and complete jurisdiction of the several States over their citizens, however, renders legislation of this character when enacted by them much more effica-

cious. Several of the Northern States have accordingly passed effective civil-rights laws of the general tenor of the constitutional provisions above considered, but aimed at individual rather than governmental interference with such rights. Thus, in many of the States railroad and other transportation companies, hotels, theatres, school boards, etc., are forbidden to discriminate against persons because of their color or previous condition of servitude, and such laws have been found to be reasonably capable of enforcement. The strong sentiment of the decade immediately following the Civil War has to a considerable extent abated, however, and, though the negro is still far from the enjoyment of the civil rights of his white fellow citizens, the demand for such legislation as that above described has, at the beginning of the twentieth century, well-nigh died out. This is probably due in a measure to a growing conviction that such rights are rather to be won by the growth of intelligence, virtue, and industry than gained by legislation.

RIGHTS, Declaration and Bill of. A statement of the fundamental rights of the English nation prepared by the convention which called the Prince and Princess of Orange to the throne of England after the revolution of 1688 and which was imposed on William and Mary as a condition of their succession to the crown. This declaration, drawn up by a committee of the Commons and assented to by the Lords, began by declaring that King James II had committed certain acts contrary to the laws of the realm. The King, by whose authority these unlawful acts had been done, had abdicated the throne, and the Prince of Orange having invited the estates of the realm to meet and deliberate on the security of religion, law, and freedom, the Lords and Commons had resolved to declare and assert the ancient rights and liberties of England.

This declaration of rights was presented to the Prince and Princess of Orange at Whitehall and was accepted by them with the crown. Being originally a revolutionary instrument, drawn up in an irregular assembly, it was considered necessary that it should be turned into law. The declaration of rights was therefore brought forward in the Parliament, into which the convention had been turned, as a bill of rights, and passed the Commons; but an amendment proposed in the Lords regarding the settlement of the crown on the issue of the Princess Sophia, in the event of Mary, Anne, and William all dying without issue, led to several ineffectual conferences between the two Houses, which ended in the measure being dropped. The bill was, however, reintroduced in the following session of Parliament (1689) without the proposed amendment, when it passed both Houses and obtained the royal assent—a clause, however, being added, which originated in the House of Lords, to the effect that the kings and queens of England should be obliged, on coming to the throne, in full Parliament or at the coronation, to repeat and subscribe the declaration against transubstantiation, and that a king or queen who should marry a Roman Catholic would be incapable of reigning in England and his or her subjects would be absolved from their allegiance. The coronation provisions in the Declaration of Rights have been closely adhered to in England ever since the days of William, but enactments of Parliament in 1901 have rendered it possible to make certain modifications in the coronation oath whereby Roman Catholics may not be offended, especially in the declaration against transubstantiation. The text of this declaration may be found in Adams and Stephens, *Select Documents of English Constitutional History* (New York, 1901).

RIGHTS, Legal. In attempting to define a legal right juristic writers lay more or less stress upon the following points: 1. A legal right is a power or complex of powers accorded by the law to a person, natural or ideal. The person to whom a right is accorded, in whom it is vested, is sometimes termed the person of inherence. 2. A legal right implies a general duty of all other persons not to interfere with its exercise. If a right entitles its holder to demand from a particular person a special forbearance or a special act, a special duty rests upon that person. The persons upon whom duties rest or against whom rights run are sometimes termed persons of incidence. 3. From the correspondence of rights and duties it results that the law may create rights by implication, by imposing general or special duties. 4. Rights are limited powers. Unlimited powers belong only to the sovereign, the state. 5. Rights protect interests. The interests protected may be public or private or mixed.

It is not always admitted that every legal right implies a corresponding general duty of noninterference. It is often asserted that obligations which are rights in personam (q.v.), calling for acts of forbearance from particular persons, imply no duties resting upon other persons. Interference between obligors and obligees is, however, possible; and in some cases the law affords remedies. The question is of practical importance, because the theory that the rights of a creditor (e.g., those of an employer) have no protection against the acts of third persons tends to impede the development by the courts of adequate remedies for interference with such rights.

If all rights run against all members of the community, it is unnecessary and confusing to assert this especially of rights in rem (q.v.). Properly speaking, the substantive right in rem has no personal incidence until it is infringed. The infringement begets a remedial right which has personal incidence.

The right in its personal incidence was termed by the Romans *actio*, and is termed in English law right of action. The German law uses the word "claim" (*Anspruch*).

By substantive rights we mean those rights which constitute part of the normal legal order. Purely personal rights (life, liberty, physical integrity, reputation, etc.), family rights, rights in rem, and rights in personam which impose upon the person of incidence no duty except of forbearance—all these rights contemplate the maintenance of a certain state of affairs. As long as the contemplated state of affairs is maintained, these rights are satisfied. When it is disturbed, remedial rights come into existence. The prime remedial right, which every legal system recognizes, is that of defense against wrongful aggression. Early law gives further rights of self-help, but in every highly developed system these are greatly restricted. The private person whose right has been violated is regularly referred for redress to the courts; his remedial rights are rights of action in the narrower sense. If the invasion of the

right is also a crime, the modern state exacts penalty of its own motion.

When substantive rights in personam impose upon the person of incidence a positive duty, e.g., to pay money or to do something, the right is unsatisfied until the duty is performed. In such a case a remedial right (right of action) exists side by side with the substantive right from the outset. This distinction is of importance in the law of prescription or limitation of actions (doctrine of *actio nata*). Some writers assert that in these cases there is no substantive right that is distinguishable or separable from the remedial right, but this is not the view held by the English courts.

Logically remedial rights are a consequence of substantive rights: "where there is a right there is a remedy." Historically substantive rights have been defined gradually by the development of remedies to meet particular wrongs.

The essential elements of rights related as means and ends are power and interest. These elements are separable. Power may be held by one person in the interest of another or of others. This is the aspect which family rights —rights of husbands, fathers, and guardians— assume in highly developed law. This is the position assigned in English law to executors and administrators. This is also at every legal system the position of the corporation. The legal power is held by the ideal or juristic person, the corporation. The interest may be that of the members, as in the ordinary private corporation; or it may be that of the public or of a section of the public, as in the charitable corporation, in the state, and in all the subdivisions of the state. In all these cases of separation of power and interest, the legal right is in the natural or ideal person who holds the power and the equitable right in the persons whose interests are represented—the beneficiaries.

Corporations, unless prohibited by statute, may hold legal rights when the corresponding interest is that of another corporation. This is the origin of the popular term "trust," now loosely applied to all extensive industrial and financial combinations. A state may hold power in the interest of other than its members. During the period intervening between the Spanish-American treaty of peace and the establishment of the Cuban Republic, the United States, as the Supreme Court affirmed, held the sovereignty of Cuba in trust.

When a private person, natural or juristic, holds a legal right which subserves not only the interest of the holder, but a public interest also (mixed interest), such private person or corporation is in reality a quasi trustee. The right held is said to be affected with a public use, and its exercise is subjected to public control.

The distinction between private and public rights is based on the character of the interest subserved rather than on the legal position of the person who exercises the power. When a citizen is exercising his right of voting we do not term him a public officer, but he is exercising a public right. When the state or any public corporation holds property as a financial investment or enters into a contract, the rights accruing to the state should be treated as private rights. This is the theory of the civil law (state as fiscus), but not of the English law as regards the sovereign nor of the American law as regards the nation or the several States. In Anglo-American law, however, the correct theory is applied in the case of other public corporations; and American law is working towards the correct practice through the establishment of courts of claims. For literature, consult the works referred to under JURISPRUDENCE; see also EQUITY; JUSTICE; LAW; NATURAL LAW.

RIGHTS, NATURAL. See NATURAL LAW.

RIGHTS, PETITION OF. See PETITION OF RIGHTS.

RIGHTS OF MAN. The term applied to a group of fundamental rights embodied in a famous declaration adopted by the French National Assembly on Aug. 26, 1789. It was drawn up principally by Dumont in response to the suggestion contained in several of the *cahiers* that in order to prevent the recurrence of abuses a clear statement of the rights of the individual should be prepared and given the sanction of the estates. It declares that all men are born and remain equal in rights; that social distinctions can be founded only on the general good; that law is the expression of the general will and every citizen has a right to participate in its enactment either personally or through his representative; that public burdens should be borne by all members of the state in proportion to their ability; that the elective franchise should be extended to all; that no one should be accused, arrested, or imprisoned except according to due process of law; that no one should be disturbed on account of his religious opinions; that the free interchange of ideas is one of the most valuable rights of the citizen and hence every one may freely write, speak, or print without interference, although subject to responsibility for abuse of the right; that all citizens have a right to decide personally or through their representatives as to the necessity of public contributions, to know how they are applied, etc. The declaration aroused general enthusiasm throughout France and appeared in modified form in the succeeding French constitutions down to 1848, and has served as a model for similar declarations in other continental countries. Louis XVI under the pressure of the events of October 5, after first refusing, was induced to support it. Much of the political philosophy embodied in the French declaration had appeared in the American Declaration of Independence and in the famous Virginia Bill of Rights of 1776. The principles embodied in the Rights of Man were attacked by Edmund Burke in his *Reflections on the French Revolution* and characterized as a declaration of anarchy. It was in reply to Burke's views that Thomas Paine (q.v.) wrote his *Rights of Man*, for which he was prosecuted in London for libel and found guilty. For the text of the French declaration, consult J. H. Robinson, *Readings in European History* (2 vols., New York, 1903); also Lyman Abbott, *Rights of Man* (Boston, 1901).

RIGHT WHALE. The Greenland whale (*Balæna mysticetus*), the foremost of the whalebone whales, so called because it was considered by the early whalemen of the North Atlantic the right or proper whale among the various species they encountered. See Plate of WHALES; and Colored Plate of MAMMALIA.

RIGI, rē'gē, or **RIGHI.** An isolated mountain on the border of the cantons of Schwyz and

Lucerne, Switzerland, between lakes Lucerne and Zug (Map: Switzerland, C 1). Altitude, 5905 feet. It has a hotel at the summit and commands extensive views of some of the finest Swiss scenery. Two rack-and-pinion railways lead up to the summit. The entire mountain is covered with pastures and woods.

RIGID BODY. See MECHANICS.

RI'GOLET'TO. An opera by Verdi (q.v.), first produced at Venice, March 11, 1851; in the United States in 1853 (New York).

RI'GOR. See IRRITABILITY.

RIGOR MOR'TIS (Lat., stiffness of death), or POST-MORTEM RIGIDITY. A peculiar evanescent stiffening of all the muscles of the body which occurs shortly after death. Both the voluntary and involuntary muscles are affected. The condition begins immediately after all indications of irritability to mechanical or electrical stimulation have ceased, but before putrefaction sets in. It affects the neck and lower jaw first, then the upper extremities, extending from above downward, and finally reaches the lower limbs. Rigor comes on more rapidly after muscular activity, is hastened by warmth and retarded by cold. During the passage of a muscle into rigor mortis heat is developed, carbonic acid is liberated, and the reaction of the tissue becomes acid instead of alkaline. The cause of post-mortem rigidity is now believed to be chemical, viz., the coagulation and separation of the muscle plasma. See MUSCLE.

RIG-VEDA, rĭg'-vā'dȧ. See VEDA.

RIIS, rēs, JACOB AUGUST (1849–1914). An American social reformer and author, born at Ribe, Denmark, May 3, 1849, and educated in the Ribe Latin School. After coming to the United States in 1870 he had a varied experience as carpenter, coal miner, farm laborer, cabinetmaker, traveling salesman, and newspaper reporter. In 1877 he was taken on the staff of the New York *Tribune* as a reporter stationed at police headquarters. Subsequently for many years he was police reporter for the New York *Evening Sun.* Jacob Riis was active in tenement-house and school reform in lower New York, and aided greatly in the movement which introduced parks and playgrounds in congested neighborhoods. In 1896 and 1897 he was executive officer of the Good Government clubs, and in 1897 became secretary of the New York Small Parks Commission. In his early days as a reporter Riis had become acquainted with Theodore Roosevelt, when the latter was police commissioner of New York, and thereafter the two were the warmest of friends. The results of much of Riis's study among the poorer classes were presented in his well-known volume, *How the Other Half Lives* (1890; new ed., 1903). Other works by him are: *The Children of the Poor* (1892; new ed., 1902); *Out of Mulberry Street* (1896), a collection of fiction; *A Ten Years' War* (1900); his autobiography, *The Making of an American* (1901; new ed., 1913); *The Battle with the Slum* (1902); *Children of the Tenements* (1902); *The Peril and the Preservation of the Home* (1903); *Theodore Roosevelt, the Citizen* (1904); *The Old Town* (his birthplace) (1909); *Hero Tales of the Far North* (1910); *Neighbors: Life Stories of the Other Half* (1914).

RIJKS-MUSEUM. See AMSTERDAM.

RIJN, REMBRANDT HARMENSZ VAN. See REMBRANDT.

RIKER, rī'kẽr, ANDREW L. (?–). An American automobile engineer and automobile designer. He produced the first toothed armature and was among the first to manufacture electric trucks and other vehicles and gasoline automobiles for racing. His work contributed much to the international reputation of the American automobile. He was one of the first presidents of the Society of Automobile Engineers. In 1900 he received a medal from the French government for meritorious automobile design. Secretary Daniels appointed him a member of the United States Naval Advisory Board in 1915.

RIKWA, rĭ-kwä', or **RUKWA,** rŭ-kwä', or LAKE LEOPOLD. A lake basin in German East Africa lying in a branch of the rift valley, 50 miles east of the southern end of Lake Tanganyika (Map: Congo, F 4). Length, about 30 miles; width, 12; but the lake is temporarily enlarged during the rains. High and steep mountains surround it. It has no outlet, and its water is saline. The lake is rapidly drying up. It was discovered in 1880 by Thomson.

RI'LEY, CHARLES VALENTINE (1843–95). An American entomologist, born at Walton-on-Thames, England. He studied at Dieppe and Bonn and in 1860 came to the United States. In 1868 he was appointed State entomologist of Missouri and he began with B. D. Walsh the publication of the *American Entomologist.* In 1877 he was appointed a member of the entomological commission to investigate the locust plague in the West, and in 1878 he became United States entomologist, in which capacity he served until 1894, except during the years 1879 and 1880. In 1884 he became curator of insects in the United States National Museum, to which he presented his collections. His publications were very numerous. They include the nine *Annual Reports on the Insects of Missouri* (1868–77); *Potato Pests* (1876); *Locust Plague in the United States* (1877); and *Annual Reports of the Entomologist of the Department of Agriculture* (1878, 1881–94). He founded and for a long time edited the journal *Insect Life.*

Riley organized the division of entomology of the United States Department of Agriculture. His work on the grapevine phylloxera gained him many honors from the French government. His most important philosophical paper was "On the Causes of Variation in Organic Forms," published in the *Proceedings of the American Association for the Advancement of Science* for 1888.

RILEY, I(SAAC) WOODBRIDGE (1869–). An American philosophical scholar, born in New York City. He was educated at Yale (A.B., 1892; Ph.D., 1902). In 1902–04 he served as acting professor of philosophy at the University of New Brunswick, and then for three years held the Johnston research scholarship at Johns Hopkins. After 1908 he was professor of philosophy at Vassar College. An associate editor of the *Psychological Bulletin* after 1903 and of the NEW INTERNATIONAL YEAR BOOK in 1908, he published: *The Founder of Mormonism: A Psychological Study of Joseph Smith, Jr.* (1892); *American Philosophy: The Early Schools* (1907); *American Thought from Puritanism to Pragmatism* (1915).

RILEY, JAMES WHITCOMB (1853–1916). An American poet, born at Greenfield, Ind., Oct. 7, 1853. He first gained attention under

the pen name Benj. F. Johnson, of Boone. Riley's father was a well-to-do lawyer, but the son was not attracted by the professions. He worked first as a sign painter, and afterward joined a company of strolling actors, for whom he used to remodel songs and write plays. His reputation rests in part on his brilliant gift of mimicry. In 1873 he joined the staff of the Indianapolis *Journal*, to which paper his first verses were contributed in 1875. Much of his verse is written in the so-called Hoosier dialect, but many of his most beautiful compositions are in pure English. The dialect poems deal with scenes of simple life and are deservedly famous for their homely humor and pathos, their originality, sincerity, quizzical kindliness, and understanding of Indiana character. In this rôle the author is par excellence the Hoosier Poet. Riley is also a genuine poet of childhood, for in maturity he did not forget or scorn the child's point of view. He was elected to the American Academy of Arts and Letters and received the gold medal of the National Institute of Arts and Letters. In 1915 for the first time, his birthday was observed as Riley Day throughout Indiana. His first book of verse, which appeared in 1883, was entitled *The Old Swimmin'-Hole and 'Leven More Poems, by Benj. F. Johnson, of Boone.* Thereafter volumes appeared at short intervals. Among them are: *The Boss Girl, a Christmas Story, and Other Sketches* (1885); *Character Sketches and Poems* (1887); *Afterwhiles* (1887); *Old Fashioned Roses* (1888); *Pipes o' Pan* (1888); *Rhymes of Childhood* (1890); *The Flying Islands of the Night* (1891); *Neighborly Poems* (1891); *Green Fields and Running Brooks* (1892); *Poems Here at Home* (1893); *Armazindy* (1894); *A Child World* (1896); *The Rubaiyat of Doc. Sifers* (1897); *Home Folks* (1900); *Book of Joyous Children* (1902); *A Defective Santa Claus* (1904); *An Old Sweetheart of Mine* (1902); *Out to Old Aunt Mary's* (1904), perhaps best known of all; *The Raggedy Man* (1907); *The Little Orphant Annie Book* (1908); *Old Schoolday Romances* (1909); *When the Frost is on the Punkin and Other Poems* (1911); *Knee Deep in June and Other Poems* (1912); *Old Times* (1915). In 1913 appeared the biographical edition of his works (6 vols.).

RIMBAUD, răn'bō', Jean Arthur (1854–91). A French poet and adventurer, connected with the Symbolist movement in French literature. He was born at Charleville (Ardennes) and was sent to a good school. He began to write verses as a child and ceased to write them at 19. In 1871 he went to Paris, and there the Parnassians, above all Verlaine, welcomed the precocious author of the *Bateau Ivre.* His connection with the Commune forced him to leave France shortly after this date, and, accompanied by Verlaine, he went to England and Belgium, where he had a violent quarrel with his friend, an account of which he published in *Une saison en enfer* (1873). In 1880 he went to north Africa, where he became a trader, with headquarters at Harrar and Shoa. By 1890 he had accumulated a fortune, but died at Marseilles on his return to France. His poems were published in Paris in 1886 by Verlaine, who thought the author of them dead, and they attracted much attention. The *Illuminations* contains his sonnet on the vowels and the few other poems that make him one of the most original of French poets. His works were collected by his brother-in-law, Paterne Berrichon, who also gives a sketch of his life in *Vie de Jean-Arthur Rimbaud* (1898). Consult also George Moore, *Impressions and Opinions* (London, 1891), and Arthur Symons, *The Symbolist Movement in Literature* (New York, 1900).

RIMI. See Eriodendron.

RIMINI, rē'mē-nē (anciently *Ariminum*). A city and bathing resort in the Province of Forlì, Italy, situated on the Marecchia, near the Adriatic, 69 miles southeast of Bologna (Map: Italy, D 2). Rimini has regular streets, well-built houses, and many fine churches. The thirteenth-century Gothic cathedral was rebuilt in the Renaissance style of the fifteenth century. The interior is embellished with allegorical figures and frescoes. The city has a town hall with a picture gallery and archæological museum, and a library of 41,500 volumes. There are a technical school and a school of navigation. Among the objects of interest are the well-preserved marble bridge of Augustus over the Marecchia, a triumphal arch, and the remains of an amphitheatre. The port of Rimini is crowded with vessels engaged in the fisheries, which employ nearly half the population. The other industries are silk spinning, salt refining, and the manufacture of glass, rope, and furniture. Pop. (commune), 1901, 43,203; 1911, 50,852; (town), 29,545. Rimini was founded by the Umbrians. It became an important city under the Romans and was the terminus of two great roads leading from Rome. Here in 49 B.C. Julius Cæsar began the war which made Rome an empire. In the thirteenth century Rimini passed under the rule of the powerful family of Malatesta (q.v.), who were dispossessed by Cesare Borgia in 1500; then for 25 years, beginning with 1503, it was subject to Venice. It was a papal possession from 1528 to 1797 and from 1815 to 1860. The Council of Rimini, held in 359, condemned the teachings of Arius.

RIMINI, Francesca da. See Francesca da Rimini.

RIM'MER, William (1816–79). An American sculptor, painter, draftsman, and author. He was born in Liverpool, England, but came to Massachusetts in his early youth and was self-taught in art, having practiced medicine for 15 years before devoting himself to sculpture, painting, and lecturing. He delivered the first course of lectures on art before the Lowell Institute of Boston, and gave courses also at Harvard University, at the National Academy and at the Cooper Institute, New York. These lectures were always illustrated by remarkable blackboard sketches. A summary of them is contained in his erudite *Art Anatomy* (1877). In 1876 he was appointed professor at the Boston Museum School. Dr. Rimmer possessed an extraordinary personality and remarkable knowledge of anatomy, and although his sculpture and paintings are deficient in technique, his drawings show much skill and imaginative power. His sculptures include a colossal granite head, "St. Stephen" (Boston Museum); "The Falling Gladiator," "Fighting Lions," and "The Dying Centaur" (all in the Metropolitan Museum, New York); and a statue of Alexander Hamilton (Boston). He published a volume on the *Elements of Design.* Consult his biography by Bartlett (Boston, 1882).

RIM'MON. The name of an Aramæan deity

who had a temple in Damascus, according to 2 Kings v. 18. The word also occurs in proper names, although in such cases it is frequently difficult to decide between the name of the god and the word for pomegranate (Heb. *rimmōn*). Rimmon is now identified with the Babylono-Assyrian storm god Adad, who seems to have had the surname Ramman, the roarer, and who is undoubtedly the same as the Syrian Hadad. See HADAD; RAMMAN.

RIMOUSKI, rē'mōōs'kē. A town, port of entry, and the county seat of Rimouski County, Quebec, Canada, on the south shore of the St. Lawrence River and on the Intercolonial Railway, 180 miles northeast of Quebec by rail (Map: Quebec, M 3). It is the seat of a Roman Catholic bishop and has a Roman Catholic cathedral. The manufactures include lumber, flour, pulp, sashes, and doors. Pop., 1901, 1804; 1911, 3097.

RIMPLER, HERMANN SCHMIDT-. See SCHMIDT-RIMPLER, HERMANN.

RIM'SKI-KOR'SAKOV, NICHOLAS ANDREYEVITCH (1844–1908). A Russian musician and composer, born at Tikhvin in the Government of Novgorod, March 18, 1844. Although his musical talent showed itself early his parents sent him to the Naval Academy at St. Petersburg, where he graduated in 1862. While making a tour of the world as midshipman in the Russian navy he wrote his first symphony. After his return, Balakirev (q.v.) became interested in the work and produced it in 1865. This decided the career of Rimski-Korsakov. He joined the circle of the so-called Younger Russians, who strove for the development of the national element in their music. In 1871 he became professor of composition and instrumentation at the St. Petersburg Conservatory, which post he held till his death. After his retirement from active service in the navy in 1873 he was appointed inspector of the navy bands. In 1886–90 he acted as conductor of the Russian Symphony Concerts in St. Petersburg. As a composer he occupies a conspicuous place among the great Russian masters. His talent manifests itself to best advantage in the free forms of the symphonic poem and the opera, and he shows a decided predilection for employing real folk themes as his thematic material. These he develops with consummate skill. In the majority of cases he is also his own librettist. As a brilliant instrumentator he is unsurpassed and several eminent composers, especially Borodin and Mussorgski (qq.v.), owe much of the success of their operas to Rimski-Korsakov's masterly instrumentation. He died in St. Petersburg, June 21, 1908. Of his 13 operas the more important are: *Snegurochka* (1880); *Mlada* (1892); *Sadko* (1897); *Mozart and Salieri* (1898); *Tsarsky Mievesta* (1899); *Kastchei* (1902); *Pan Voyevoda* (1904). He also wrote three symphonies, a symphonic poem, *Sadko*, overtures, chamber music, sacred music, and piano pieces.

RINALDO, rē-näl'dō (Fr. *Renaud, Regnault*). The bravest of the sons of Aymon (q.v.). He figures prominently in the *Orlando furioso, Orlando innamorato, Gerusalemme liberata, Renaud de Montauban,* and other early romances, French and Italian.

RINALDO RINALDINI, rē'näl-dē'nē. A noted robber romance by Christian August Vulpius (1798), which was translated into many languages. It is the prototype of innumerable romances in the same field. A revised edition by Gildemeister appeared in 1890.

RINCEAU, răn'sō'. A French word designating a continuous foliated scroll, carved or painted. The type, first developed by the Greeks of the Alexandrian age, was further perfected by the Romans, who made of it the most splendid of ornament forms. The Renaissance revived its use, and it has remained to this day a prolific motive in all the arts. In essence it consists of a continuous waving stem which throws off branching spirals alternately on either side, richly adorned with conventional leafage.

RINDERPEST, rĭn'dĕr-pĕst. See CATTLE PLAGUE.

RINDFLEISCH, rĭnt'flīsh, GEORG EDUARD VON (1836–1908). A German pathologist, born in Köthen and educated at Heidelberg and Würzburg. In 1856 he went to Berlin to work under Virchow, and in 1861 became Heidenhain's assistant in histology at the University of Breslau. After a short stay in Zurich he became professor at Bonn in 1865 and in 1874 at Würzburg, where a splendid pathological institute was built under his direction. He retired in 1906. Rindfleisch studied especially the diseases of the skin, and urged the scrofulous character of pulmonary tuberculosis. His *Lehrbuch der pathologischen Gewebelehre* (1866–69; 6th ed., 1886) was translated into English as *A Text-Book of Pathological Histology* (Philadelphia, 1872) and *Manual of Pathological Anatomy* (London, 1872–73). Another of his principal works is *Elemente der Pathologia* (1883; 3d ed., 1896; Eng. trans., *The Elements of Pathology*, Philadelphia, 1884).

RINE'HART, MARY ROBERTS (1876–). An American story writer, born in Pittsburgh, Pa., and educated in the public schools of that city and at its training school for nurses. In 1896 she married Stanley Marshall Rinehart, M.D. Her books, largely detective stories, entertaining of their kind, include: *The Circular Staircase* (1908); *The Man in Lower Ten* (1909); *When Man Marries* (1909); *The Window at the White Cat* (1910); *The Amazing Adventures of Letitia Carberry* (1911); *Where There's a Will* (1912); *The Case of Jennie Brice* (1913); *The After House* (1914); *"K"* (1915); *Kings, Queens, and Pawns* (1915), impressions of the European War. From her pen came also the plays: *Double Life* (1907); *The Avenger* (1908), with her husband; *Seven Days* (1909), with Avery Hopwood; *Cheer Up* (1913).

RINEHART, WILLIAM HENRY (1825–74). An American sculptor. He was born in Carroll Co., Md., and did his first work as a sculptor while a stonecutter in a quarry on his father's farm. In 1846 he removed to Baltimore, studying in the night schools of the Maryland Institute, and in 1855 he went to Florence, Italy. After his return to Baltimore two years later he executed numerous busts and the two statuettes, an "Indian" and a "Backwoodsman," once supports for the clock in the national House of Representatives. He returned to Italy in 1858, settling at Rome, where he died. Rinehart completed the great bronze doors of the capitol at Washington, which Crawford left unfinished at his death. His work may be studied best at the Peabody Institute, Baltimore, and the Corcoran Art Gallery, Washington. The former owns 42 plaster casts of his most important busts, figures, and reliefs,

including the early reliefs of "Day" and "Night," the nude statue "Entering the Bath" (1858), "Strewing Flowers" (1864), "Hero," and, most attractive of all, the life-size marble "Clytie." The Corcoran Gallery possesses among several others the charming little "Endymion," "Penseroso," a bust, and the "Sleeping Children," a replica. In the Metropolitan Musuem, New York, are "Latona and her Children" (1874), "Rebecca," and the less interesting "Antigone." Rinehart's marble statue of Chief Justice Taney (1872) is in Annapolis and a replica is in Baltimore.

Although he was one of the last American sculptors of classic tendencies, Rinehart's art is less mannered than most contemporary work, and displays at its best poetic charm and refined, skillful modeling. At his death he bequeathed his property, which ultimately amounted to $100,000, to the Peabody Institute for the encouragement of young sculptors in Paris and Rome and otherwise promoting the art of sculpture. In 1895 the first scholarships were awarded. Consult Lorado Taft, *History of American Sculpture* (New York, 1903).

RING (AS. *hring*, OHG. *hring*, ring, Ger. *Ring;* connected with Lat. *circus* and equivalent to the Gk. δακτύλιος, Lat. *anulus*, Fr. *anneau*). A small round band made of gold, silver, and other metals and materials, used to adorn the finger. Similar rings are sometimes worn on the ear (see EARRING) or even on the nose by primitive peoples of India and Africa. The ring is the most ancient and the most personal form of jewelry. The fashion of wearing finger rings dates from remote antiquity. Prometheus, condemned by Jupiter to be fettered forever to a rock because he stole the sacred fire, fulfilled the letter of the sentence by wearing on his thumb an iron ring in which a piece of the rock was set. It is said that when the Lydian King Gyges turned the bezel of his ring inward upon the palm he became invisible. Rings set with scarabs, or sacred beetles, were much used by the Egyptians. Jezebel used her husband's seal ring to sign the false letters about Naboth's vineyard. Darius with his signet sealed up the lion's den. The Romans of Tiberius' time decreed that gold rings should be worn only by patricians descended from two generations of freedmen. Other freedmen might wear silver rings. Slaves could wear iron rings only. Both freedmen and slaves sought to evade this law by covering their rings with gilt foil. The early Italians loved rings passionately. The Doge of Venice cast a ring into the sea every year to symbolize the wedding of the Queen of the Adriatic. Giardinetti rings of the early Renaissance have stones set in tiny floral patterns. King Edward's coronation ring was first worn by Queen Victoria. It is a modification of the ring worn by Charles I, which is preserved in Edinburgh Castle. The bezel, engraved with a St. George's cross, is a flat ruby surrounded with diamonds. Rings whose bezels carry several gems are called cluster rings. When the bezel is shaped like a lozenge, marquise is the name. This setting was invented in France in the reign of Louis XV. The ancients believed that the ring finger—the third on the left hand, on which the engagement ring is invariably worn—contained the vein most direct from the heart. A plain gold ring on the same finger is used as the wedding ring.

The most beautiful seal rings are those set with hard, semiprecious stones—jade, jasper, carnelian, onyx, hyacinth, agate, bloodstone. In these the device is engraved in niello, the intaglio printing in relief on the wax. Cameos are engraved in relievo, the reverse of intaglio. The custom of wearing mourning rings originated in the seventeenth century. In the mourning rings of to-day blue enamel often takes the place of the massive funeral black used by our ancestors. The ancients credited gems with magic properties and assigned them to different months of the year: garnets to January, amethysts to February, hyacinths to March, diamonds to April, emeralds to May, agates to June, carnelians to July, sardonyx to August, chrysolite to September, opals to October, topazes to November, and turquoises to December. These worn in rings as birth stones are appropriate birthday gifts.

Many quaint customs in regard to rings survive from the Middle Ages and even from earlier periods. Cramp rings, supposed to heal that ailment, were blessed by the King, in connection with the healing of the King's evil. Poison rings, like the one used by Hannibal in his suicide, contained a layer of poison, and the Italian *anello della morte* was a refined means of assassination during the Middle Ages. The celebrated fisherman's ring, used by the Pope, is engraved with the picture of St. Peter in a boat and with the name of the reigning pontiff. With such a ring all the papal briefs since the thirteenth century have been sealed. Upon the Pope's death his ring is broken and another is presented to his successor by the city of Rome. The ring plays an important part in the coronation of a king and in the investiture of bishops. Before the invention of coins rings were often used as money, among the Egyptians, the Israelites, and the German and Celtic primitive peoples of Europe. Even to this day copper rings are used by African traders. See JEWELRY; RING MONEY.

Consult: King, *Antique Gems and Rings* (London, 1872); Schneider, *Die Gestaltung des Ringes vom Mittelalter bis in die Neuzeit* (Mainz, 1878); Edwards, *History and Poetry of Finger-Rings* (New York, 1880); Marshall, *Catalogue of Finger-Rings in the British Museum* (London, 1907).

RING AND THE BOOK, THE. A poem by Robert Browning (1869). A book recording an old murder in Rome, bought by the poet, suggested the plan, while the ring is the circle of evidence about the theme.

RING-BILLED GULL (so called from the colored ring about the beak). A small gull widely distributed throughout the interior of North America and along the coasts. The general color is light pearl blue, the outer wing quills black, the feet and bill greenish, and the bill encircled at the angle with a broad band of black. This gull breeds in colonies on northern sea beaches and on the shores of the lakes of the Northwestern States and Canada, and migrates southward in winter.

RING'BONE. A circle of bony matter around the horse's coronet, the result of an inflammatory action set up in the periosteum and bone tissue proper of the pastern bones, most common in the forelegs of draft horses with short upright pasterns, but occasionally occurring on the hind limbs of lighter-bred horses. Excessive work on hard roads is the most commonly attributed cause; proper rest and nour-

ishment are the best preventives. Consult Leonard Pearson and others, *Special Report on Diseases of the Horse*, published by United States Bureau of Animal Industry (rev. ed., Washington, 1911).

RING DES NIBELUNGEN, rĕng dĕs nē'belung'en, Der. See Ring of the Nibelungen.

RINGDOVE. The largest and most common of European wild pigeons (*Columba palumbus*), which is characterized by a white spot on each side of its neck, forming a nearly continuous ring. See Pigeon.

RINGED PARROT. Any one of the small long-tailed Oriental parrakeets of the genus *Palæornis*, especially the ring-necked parrakeet (*Palæornis torquatus*), which ranges from India to Cochin-China, where it often does great damage to grain crops. Its general hue is green, and the neck of the male is ornamented with a rose-red collar, incomplete in front, above which is a black ring incomplete behind. See Parrakeet.

RING MONEY. At an early stage of society, prior to the invention of coinage, but after the inconveniences of direct barter had been discovered, the precious metals, formed into rings, were used as a medium of exchange. The use of ring money among the Egyptians is proved by representations in their wall paintings. The gold or silver rings were formed of a wire or bar of metal bent into a circle, but not quite united at the extremities, so that they could be made into a chain, from which portions could be detached at pleasure. It seems probable that the individual loops were not adjusted to a particular weight, but that each bundle of loops amounted in the aggregate to a particular weight. The ring money of the East found its way at an early period to western Europe and the British Islands.

RING-NECKED LIZARD. See Collared Lizard.

RING-NECKED SNAKE. A harmless American snake (*Diadophis punctatus*), about 15 inches long, blue black above and orange yellow below, with a yellow ring about the neck.

RINGNES (rĕng'nĕs') **LANDS.** Two Arctic islands, Amund and Eilef, extending from lat. 77° to 79° N. and between long 95° and 105° W., discovered by Isaachsen in 1901. See Sverdrup.

RING OF THE NIBELUNGEN, nē'belung'en. A tetralogy of music dramas, by Richard Wagner (q.v.), comprising *Das Rheingold*, *Die Walküre*, *Siegfried*, and *Götterdämmerung*. The drama was first produced in its entirety at Bayreuth in 1876 (August 13–17) and in the United States in the Metropolitan Opera House, New York, in 1889 (March 4–11). The story is related to the Nibelungenlied, but contains much more Norse than German elements. The plot of Wagner concerns the magic hoard of gold in possession of the three Rhine maidens. He who shall forswear love and fashion from the gold a ring shall gain supreme power in the world. In the *Rheingold* Alberich, the Nibelung, seizes the gold, having renounced love, and he fabricates the powerful ring. He also causes the magic Tarnhelm (cap, with the power of making the wearer invisible) to be made. Wotan, chief of the gods, has promised to give Fréia to the Giants for building his castle. They, however, accept in lieu the treasure which Alberich has amassed by means of the ring. The maddened Alberich curses the ring and its possessor. In the *Walküre* Siegmund draws the fateful magic sword from the tree trunk and wins the love of Sieglinde. Brünnhilde disobeys Wotan by trying to shield Siegmund in his mortal contest with the lawful Hunding and thus having favored Siegmund's union with Sieglinde, the mother of the future Siegfried. Brünnhilde is condemned by Wotan to helpless sleep, encircled by fire. In *Siegfried* the hero at length appears, having been reared by Mimi, the Nibelung. He forges a magic sword (Needful) and kills the dragon which guards the fateful ring after which Wotan had lusted and thus foredoomed the reign of the gods. Siegfried also kills Mimi, who had intended to betray him. A bird tells him of the sleeping Brünnhilde surrounded by fire. He seeks the spot, plunges through the fire, finds the Valkyrie, and wins her. In *Götterdämmerung* Siegfried gives her the ring on his setting out for fresh exploits, but keeps his wonderful sword and the Tarnhelm. Through magic he falls in love with Gutrune and proposes to give Brünnhilde to Gunther. Siegfried wrests the ring from Brünnhilde. She perceives his faithlessness and consents to his murder by those jealous of him. Hagen kills him, and the despairing Valkyrie mounts the funeral pyre with the dead Siegfried. The Rhine daughters regain the ring, and the Valhalla burns.

RING OUZEL, o͞o'z'l, or Moor Blackbird. A European thrush (*Merula torquata* or *Turdus torquatus*), well known in the less frequented parts of Great Britain, where it does great harm to ripening fruit. It is blackish brown, each feather edged with gray, and is conspicuously marked with a white crescentic throat patch, from which it receives its name. In its notes, manner of nesting, and behavior generally it is much like an American robin.

RING PLOVER. A plover of the typical genus *Ægialitis*, the species of which are characterized among other peculiarities by the dark ring or gorget around their necks. The American ringed plover or ringneck (*Ægialitis semipalmata*) is dispersed in summer all over North America and breeds throughout Canada. Another species often called ring plover by the gunners is the piping plover (*Ægialitis meloda*). Consult Elliott Coues, *Birds of the Northwest* (Washington, 1874).

RING SNAKE. The common snake of Great Britain (*Tropidonotus natrix*), so called because of the collar-like whitish markings behind the head. See Water Snake.

RING-TAILED IGUANA. An iguana (*Cyclura carinata*) of Jamaica, especially numerous in the hills near Kingston, which is about 4 feet in total length and olive green, with the tail marked with blackish bands. These iguanas feed mainly on grass, are timid, galloping to the trees on the least alarm, and are uneatable on account of a most disagreeable odor.

RINGWALDT, rĭng'vält, Bartholomäus (1530–99). A German didactic poet, born in Frankfort-on-the-Oder. In 1578 he became pastor of a Protestant congregation at Langenfeld. He wrote some Church hymns, of which all caught the swing of the popular poetry of the time, and one beginning "Herr Jesu Christ, du höchstes Gut" is still well known. They were republished in 1858. But he is more at home in didactic poetry, in which he decries the evils of the day, even those within the Protestant

body. *Die lautere Wahrheit* (1585) is an enchiridion. *Die christliche Warnung des treuen Eckarts* (1588) with its hero, who describes heaven and hell, gave Ringwaldt a rare opportunity for satire, and the book was long popular. A third work, *Speculum Mundi* (1592), is cast in dramatic form and in greater degree portrays contemporary manners. Consult Hoffmann von Fallersleben, *Ringwaldt und Schmolck* (Breslau, 1833).

RING'WORM. A contagious parasitic skin disease due to the trichophyton fungus. It attacks the scalp, the body, and the beard and according to its location is denominated tinea tonsurans, tinea circinata, and tinea sycosis. All three forms are exceedingly contagious and spread by contact and by the use in common of hats, brushes, combs, towels, and razors. Ringworm of the scalp usually begins in the form of small circumscribed patches, the skin of which is more or less raised, pink, swollen, and covered with branny scales. As the disease progresses the patches become the seat of vesicles and pustules. The hair follicles are affected, and the hairs are seen to be broken off short, twisted, and bent, and if placed under the microscope may be observed to be quite opaque and converted into a mass of fungus spores. As a result of the loss of hair, baldness, more or less complete but temporary, exists over areas sometimes as large as a silver dollar. Itching is a constant symptom. Sometimes inflammation is severe, with the formation of a boggy swelling which exudes pus at many points.

Ringworm of the body occasionally coexists with tinea tonsurans, but often occurs alone. The disease begins as a small reddish scaly spot of papules, at first irregular in shape, but soon assuming a circular form. As the area increases in size the papules change to vesicles. The spot heals in the centre as it spreads at the periphery. This variety of ringworm affects the face, neck, and arms most frequently. Tinea sycosis, or ringworm of the beard, is sometimes called barber's itch. See ITCH.

Ringworm occasionally attacks the nails. These become opaque, white, and brittle, thickened and soft.

The essential point in the treatment of the varieties of ringworm affecting the hairy portions of the body is to apply to the roots of the hair one of the various parasiticides, but before this can be done the hair must be removed. This is done by shaving the affected areas and pulling out the loosened and diseased stumps with a forceps. Crusts and scales must be loosened with hot water or oily applications. Among the parasiticides which act most effectively are sulphur ointment, mercurial ointments, and iodine, carbolic acid, and caustic potash alone or in various combinations. Ringworm of the scalp is very successfully treated by exposure to the X ray. For Indian, Chinese, or Burmese ringworm, see ITCH, *Dhobie Itch.*

RINK, HINRICH JOHANNES (1819–93). A Danish explorer, born in Copenhagen. He studied natural science, gained the doctorate at Kiel (1844), acted as mineralogist to the *Galatea* expedition around the world in 1845–47, and from 1848 to 1851 explored northern Greenland. There he found his life work. From 1853 to 1871 he was inspector of southern Greenland, then for 10 years he was director of the island's trade in Copenhagen, and in 1882 he removed to Christiania. He wrote: *Die Nikobarischen Inseln* (1847); *Grönland, geographisk og statistisk beskrevet* (2 vols., 1852–57; Eng. trans., *Danish Greenland: Its People and its Products,* 1877; Ger. trans.); *Eskimoiske Eventyr og Sagn* (1866–71; Eng. trans., *Tales and Traditions of the Eskimo,* 1879); *The Eskimo Tribes: Their Distribution and Characteristics* (1887–91); *Grönländere og Danske i Grönland* (1888).

RIO, rē'ō, ANITA (1880–). An American soprano (real name Riotte), born at Alameda, Cal. She studied in New York with Florenza d'Arona and began as a church and concert singer. Operatic repertory she studied with J. Armour Galloway, whom she subsequently married. Her operatic début occurred in 1909 at Covent Garden, London, as Donna Elvira. After that she went to Italy, appearing as guest at the principal theatres of Rome, Genoa, Venice, and Naples. After 1914 she sang in the United States, chiefly with orchestra and at festivals. Her repertory included the principal lyric Italian operas and the Wagner rôles Senta, Elisabeth, Elsa, and Eva.

RÍO AGUSAN, rē'ō ä-gōō'sän. See AGUSAN.

RIOBAMBA, rē'ō-bäm'bä, or BOLÍVAR. The capital of the Province of Chimborazo, Ecuador, situated on the road from Quito to Guayaquil, 95 miles south of the former and almost at the foot of the volcano of Chimborazo, 9100 feet above sea level (Map: Brazil). It is one of the most ancient and historic towns of Ecuador and contains the ruins of an Inca palace. Completely destroyed by an earthquake in 1799, it is now well laid out and has a handsome new cathedral. Pop., 1913 (est.), 22,000.

RIO BRANCO, brän'kō. The largest tributary of the Río Negro (q.v.), Brazil.

RÍO CUARTO, kwär'tō. A town in the Province of Córdoba, Argentina, situated on the Trans-Andean Railroad 200 miles west of Rosario (Map: Argentina, G 4). It is surrounded by orchards and is the principal market for large grazing districts. Pop., 1912 (est.), 20,000.

RIO DE JANEIRO, rē'ō dā zhä-nā'rō; *Portug. pron.* rē'ụ dā zhä-nĕ'ĕ-rụ. An important state of Brazil, situated on the southeastern coast (Map: Brazil, J 8). Area, 26,634 square miles. The climate is moderate and healthful in the elevated portions, but hot and unhealthful in the lowlands along the coast. Rio de Janeiro is well wooded. The chief agricultural product is coffee. About 70 per cent of the coffee goes to the United States. Sugar is cultivated along the coast. Industrially Rio de Janeiro is one of the most advanced of the Brazilian states. It has a large number of cotton and woolen mills and sugar mills and a greater railway mileage in proportion to its area than any other state of Brazil. Pop. (est.), 1900, 926,035; 1913, 1,250,000 (it is not unlikely that the latter figure is excessive). Rio de Janeiro is, with the exception of the Federal District, the most densely populated of the Brazilian states. Most of the inhabitants are of mixed origin. The capital is Nictheroy.

RIO DE JANEIRO. The capital and largest city of Brazil, situated on the west side of the entrance to the Bay of Rio de Janeiro (Map: Brazil, J 8 and J 1). The location is exceedingly picturesque. The landlocked bay, which runs inland for 17 miles, is surrounded on all

sides by forest-covered mountains whose spurs penetrate into the heart of the city. The narrow entrance and the islands lying inside of it are fortified. The city itself stretches for 15 miles along the shore, and from its nucleus at the inner end of the entrance it spreads out in long arms reaching far into the valleys and up the hillsides. This nucleus is the old city and forms the business quarter. It is laid out in square blocks with long, narrow streets. The largest square in this section is the Parque da Acclamação, with a beautiful garden. Another park, the Praça 15 de Novembro, is surrounded by some of the finest public buildings in Brazil, such as the mint, the Senate house, and the city hall. In this neighborhood also is the former Imperial Palace, now occupied by the National Museum. The most conspicuous church is the Candelaria, with two large towers and a cupola. The principal educational institutions are the great national library, with 300,000 volumes and many manuscripts, the National Museum, the botanical garden, the Historical and Geographical Institute, and the observatory. There are also a medical school, a polytechnic institute, a conservatory of music, and various commercial, industrial, scientific, literary, and art academies.

Public charities are well provided for. There are institutes for the blind and the deaf mutes, a large insane asylum, and several well-equipped hospitals, that of Santa Casa da Misericordia being one of the largest in the world. The public works, however, are somewhat inferior. There are an extensive system of electric street railways and a good water supply brought by aqueducts from the mountains. The drainage system, however, is not serviceable. This fact, together with the hot and humid climate, renders the city still an unhealthful place.

Rio de Janeiro derives its chief importance from its commerce. The manufactures are relatively unimportant and are represented chiefly by textile and flour mills. The harbor is absolutely safe; extensive new port works were begun in 1903. The total value of imports in 1913 was $127,115,000. The chief imports are cereals, coal, textiles, and machinery. The exports in 1913 were valued at $38,721,000. The leading export is coffee. The city is sometimes regarded as coextensive with the Federal District, which has an area of 431 square miles; its population was estimated in 1913 at 1,250,000. No census has been taken since 1900. The city proper covers an area of 61 square miles.

The first settlement at Rio de Janeiro was made by the French in 1555, who were driven out by the Portuguese in 1560. The city itself was founded by the Portuguese in 1567. In 1640 it was captured by the Dutch, who held it for a short time. In 1762 it succeeded Bahía as the capital of Brazil. From 1808 to 1821 it was the residence of the court of Portugal. Consult: Allain, *Rio de Janeiro, quelques données sur la capitale* (Paris, 1885); *Rio Janeiro, Archivo do districto federal* (Rio de Janeiro, 1894–97); *Municipal Organizations in South America*, published by the Pan American Union (Washington, 1909); A. G. Bell, *The Beautiful Rio de Janeiro* (London, 1914).

RÍO DE LA PLATA, dā lä plä'tä. See PLATA, RÍO DE LA.

RÍO DE ORO, ō'rō. A Spanish possession on the west coast of the Sahara Desert, extending from Morocco to Cape Blanco and bounded on the east and south by the French Territory of Mauritania (Map: Africa, C 2). The French boundary was fixed by a convention of June, 1900, and a treaty of November, 1912. The area is estimated at about 121,400 square miles. Río de Oro is an arid, rocky, and sandy plateau, about 1000 feet high, and covered with a scant growth of esparto grass near the sea, though there are a number of oases in the interior. The climate is very dry and hot, the temperature sometimes reaching 120° F. The inhabitants, estimated at 30,000, are mixed tribes of Mohammedan Berbers and negroes, obtaining a scanty subsistence by raising cattle, sheep, and camels. The Spanish administrator, resident at Villa Cisneros on the coast, is under the Governor of the Canary Islands. Vessels from the latter exploit the fishing grounds along the coasts.

RÍO GRANDE, rē'ō grän'dā. See ARAGUAYA.

RÍO GRANDE. One of the head streams of the Paraná River (q.v.).

RIO GRANDE. A river of the southwestern United States. It rises in the Rocky Mountains in southwestern Colorado and flows first south through New Mexico, then southeast on the boundary between Mexico and Texas, and empties into the Gulf of Mexico after a course of 2000 miles (Map: Texas, C 6). Its upper course passes through rocky gorges in which it forms rapids and cataracts, and lower down it becomes a shallow stream often obstructed by sand bars. The greater part of its basin lies in an arid region, and in New Mexico its waters are largely drawn off for irrigation, so that during the hot season the river dries up for a considerable distance above and below El Paso. In its lower course it is subject to serious floods. It is navigable for small boats for about 450 miles from its mouth. Near the mouth is the town of Brownsville, and opposite to it the Mexican town of Matamoras. Consult Stevens, *The Valley of the Rio Grande* (New York, 1864).

RÍO GRANDE DE CAGAYÁN, dā kä'gä-yän'. The largest river of Luzon, Philippine Islands. It rises on the Caraballo Sur in central Luzon and flows northward 200 miles through a magnificent valley, which is becoming an important tobacco-producing region (Map: Philippine Islands, C 1, 2). It empties through the north coast into the Pacific Ocean. It is navigable for light-draft steamers.

RÍO GRANDE DE MINDANAO, mēn'dä-nä'ō. The largest river of the Philippine Archipelago. See PULANGUI.

RÍO GRANDE DE SANTIAGO. See SANTIAGO, RÍO GRANDE DE.

RIO GRANDE DO BELMONTE, dō bĕl-mōn'tā. A river in Brazil. See JEQUITINHONHA.

RIO GRANDE DO NORTE, nōr'tā. A state of northeastern Brazil (Map: Brazil, K 5). Area, 22,190 square miles. The interior is elevated and sparsely watered, the coasts are low and slightly indented. The chief river is the Piranhas. The climate is hot and dry, but healthful. The chief industries are fishing, salt production, and the preparation of a vegetable wax. Cotton, sugar cane, and rubber are cultivated, and cattle raising is carried on. Pop. (est.), 410,000. The capital is Natal (q.v.).

RIO GRANDE DO SUL, sōōl. The southernmost state of Brazil (Map: Argentina, J 3, 4).

Area, 91,333 square miles. The chief rivers are the Jacuhy, which falls into the Lagôa dos Patos, and the Ibicuhy, a tributary of the Uruguay. The climate is temperate and healthful. The mean temperature varies from about 63° to 66° F.; frosts and snow are not infrequent in the more elevated parts, while fever is almost unknown. The chief occupation is cattle raising. The principal product and export of the state is dried meat. Wheat, rice, tobacco, and the vine are cultivated. Mining of copper, gold, coal, amethysts, and agates is also carried on to some extent. There are a number of cotton, woolen, and linen mills, soap factories, and other manufacturing establishments. The commercial centre is the state capital, Porto Alegre. The transportation facilities consist of 1488 miles of railway and navigable lakes and rivers. Pop., 1913 (est.), 1,561,685. Rio Grande do Sul was colonized mostly by Germans.

RIO GRANDE DO SUL. The chief port and former capital of the State of Rio Grande do Sul, Brazil, situated at the outlet of the Lagôa dos Patos into the Atlantic Ocean (Map: Argentina, J 4). The town lies in a barren, sandy plain and has a safe harbor suitable for vessels of 15 feet draft. The city is connected by rail with Pelotas and by steamers with Porto Alegre at the north end of the lake. It exports beef and other cattle products, manioc, and Paraguay tea. It is the residence of a United States consular agent. Pop. (est.), 35,000.

RIOJA, rē-ō′hȧ, FRANCISCO DE (c.1583–1659). A Spanish poet, born in Seville. He distinguished himself as a law scholar at the University of Seville. The Count (later Count-Duke) of Olivares, a friend of Rioja, called him to Madrid about 1614, and he remained at the court some time. After the death of Philip III he returned again and was made royal librarian and chronicler by Olivares, whom he afterward followed into exile (1643). We do not know when he took orders, but in 1636 he became a canon of Seville Cathedral. His last years were spent in Seville and Madrid, where he was a member of the Inquisition. The best edition of his works is that of C. A. de la Barrera, who published the *Poesías* (1867), and *Adiciones á las poesías de D. Francisco de Rioja* (*Sociedad de bibliófilos andaluces*, vol. v, 1st series, Seville, 1872).

RIOJA, rē-ō′hȧ, LA. A province of northwest Argentina, bounded on the north by the Province of Catamarca, on the east by Catamarca and Córdoba, on the south by San Luís and San Juan, and on the west by San Juan and Chile (Map: Argentina, F 4). Area, 37,839 square miles. The climate is very dry, and irrigation is generally necessary. Wheat, corn, lucerne, and wine are the chief agricultural products, and some stock raising is carried on. La Rioja contains copper, sulphur, silver, gypsum, salt, graphite, and coal, the mineral most exploited being copper. Pop., 1912 (est.), 93,900. The capital is La Rioja, situated at the foot of Mount Belasco and connected by rail with Catamarca and the southeastern provinces. It contains a college and a normal school and has a population estimated at 8000.

RIOM, rē-ôN′. The capital of an arrondissement in the Department of Puy-de-Dôme, France, picturesquely situated on a hill 9 miles north of Clermont-Ferrand (Map: France, S., H 3). It is built of dark lava, and its domestic architecture of the fifteenth and sixteenth centuries and of the Renaissance period and its churches, Saint-Amable dating from the eleventh century, Notre-Dame-du-Marthuret from the fifteenth century, and the fourteenth-century Sainte-Chapelle, are of especial interest. Linen, leather, and brandy are manufactured. Riom was the capital of Auvergne during the fourteenth century. Pop., 1901, 11,061; 1911, 10,561.

RION, rē-ôn′. The ancient Phasis. A river of Caucasus, Russia, rising in the Government of Kutais. It flows in a westerly direction, passes Kutais, and enters the Black Sea at Poti. Total length, about 200 miles. It is navigable for 50 miles.

RÍO NEGRO, rē′ô nā′grô (Sp., black river). The largest north tributary of the Amazon. Its upper course is generally considered to be the Guainia, which rises in the southeastern part of Colombia and flows northeast to the Venezuelan boundary, then southeast into Brazil (Map: Brazil, E 4). Here it is joined by the Uaupés, which rises on the Eastern Cordillera of the Andes. It then flows in an east-southeast direction until it joins the Amazon through a great inland estuary 50 miles above the mouth of the Madeira. The largest tributary is the Rio Branco, or White River, which rises on the border of Guiana and flows south to the main stream. In Venezuela the Guainia receives the Cassiquiare, an arm sent out by the Orinoco. The total length of the Río Negro with the Uaupés is about 1400 miles. The whole river system flows through a vast forest region which is but little explored. The upper courses are navigable for long distances. At its mouth in the Amazon it is 1½ miles wide and 100 feet deep at low water, so that ocean steamers can at all times go directly to Manáos (q.v.), the great outlet for the rubber collected along the banks. Consult A. R. Wallace, *Travels on the Amazon and Río Negro* (London, 1889).

RÍO NEGRO. A river of Argentina, forming the conventional northern boundary of Patagonia (Map: Argentina, G 6). It is formed by two head streams, the Limay and the Neuquén, both of which rise on the east slope of the Andes. It flows southeast into the Atlantic Ocean, and its length up to Lake Nahuel Huapí (q.v.) is about 600 miles, through nearly the whole of which distance it is navigable, though there are dangerous reefs in several places.

RÍO NEGRO. A territory of Argentina in Patagonia, bounded by the Territory of Pampa on the north, Chile and the Territory of Neuquén on the west, the Territory of Chubut on the south, and the Province of Buenos Aires and the Atlantic Ocean on the east (Map: Argentina, F 6). Its area is estimated at 79,804 square miles. The southwestern portion belongs to the region of the Andes, while the remainder is occupied by a plateau. The chief rivers are the Río Negro and its tributary the Limay, and there are also a number of lakes. The climate is dry and healthful. The soil is fertile, but irrigation is usually necessary. The chief products are alfalfa, wheat, corn, and barley. Stock raising is carried on extensively. Pop., 1909, 26,147; 1913 (est.), 40,200. Chief town, Viedma.

RIORDAN, rī′ôr-dȧn *or* rēr′dȧn, PATRICK WILLIAM (1841–1914). An American Roman Catholic prelate. He was born at Chatham,

New Brunswick, and studied at Notre Dame, Ind., and at Rome and Louvain, Belgium (D.D., 1864). Returning to America, he became professor of theology in the Theological Seminary of St. Mary's of the Lake, Chicago. He was pastor at Joliet, Ill., from 1868 to 1871, when he assumed the rectorship of St. James's Church, Chicago. In 1883 he was appointed titular Bishop of Cabesa and Coadjutor Archbishop of San Francisco. The following year he became Archbishop. His administration was notable because of his success as plaintiff in the first case tried before The Hague Tribunal, the claim to secure the so-called Pius Fund of the Californias, held in Mexico.

RÍO SALADO. See SALADO.

RÍO SANTIAGO. See SANTIAGO, RÍO GRANDE DE.

RIOT (OF. *riot, ryot, riote, riotte*, Fr. *riotte*, It. *rictta*, riot; of unknown etymology). A form of criminal offense against the public peace, consisting in the tumultuous assembly of three or more persons of their own authority with intent mutually to assist each other against any one who shall oppose them in the doing either of an unlawful act of a private nature or of a lawful act in a violent and tumultuous manner. (Hawkins, *Pleas of the Crown*, chap. 65.) At common law the offense, unless it resulted in some more serious crime, was a misdemeanor; but in case the riot caused loss of life or serious bodily injury, the rioter might be punished for the felony committed.

If the riotous enterprise is of a public nature, in that it is directed towards the government with the purpose of overthrowing or destroying it, the offense is treason (q.v.). The assembly need not be planned by the rioters in advance. The crime may be committed also if the rioters do not specifically intend to terrify others, if such is the natural or necessary consequence of their riotous acts.

When there is an assembly of three or more persons for some riotous purpose under such circumstances as to give rise to a reasonable apprehension on the part of others of a breach of the peace, although no actual public disturbance does result, the offense is known as unlawful assembly. If some steps are taken towards the execution of the unlawful or riotous purpose which, however, fall short of actual public disturbance, the offense is known as a rout.

Under modern statutes which now generally regulate the crime and its punishment, the essential elements are the use of force or violence or threats to use force or violence accompanied by immediate power of execution. In England it is an indictable crime for a person to refuse to take part in suppressing a riot when called upon to do so by a justice of the peace or a constable.

RIOT ACT. An English statute, 1 Geo. I, st. 2, c. 5 (1715), which provided that if 12 persons or more were unlawfully assembled and disturbing the peace, any sheriff, undersheriff, justice of the peace, or mayor might by proclamation command them to disperse, and that if they refused to obey and remained together for the space of one hour after such proclamation, all participating in the assembly were guilty of felony. Any person who obstructed or prevented the making of such proclamation was also guilty of felony. The statute has not been generally reënacted in the United States, where the usual provision of the criminal law and police regulations have been found an adequate protection against rioters.

The use of the expression "read the Riot Act" generally implies the giving of a warning to those engaged in some wrongdoing.

RIO TÉODORO, or RIO THEODORO, also known as *Rio Dúvida* or *River of Doubt*. A river of Brazil, which rises in the Corde heira dos Parecis, in the western part of the State of Matto Grosso. It flows northward between long. 59° and 61° W. for a distance of 930 miles and empties into the Madeira River, of which it is the chief affluent. It was explored and placed on the map by the Roosevelt-Rondon expedition in 1914. Consult Theodore Roosevelt, *Through the Brazilian Wilderness* (New York, 1914).

RIO THEODORO. See RIO TÉODORO.

RIO TINTO. See MINAS DE RIO TINTO.

RIPA'RIAN RIGHTS. The legal rights of owners of land containing a watercourse, or bounded by one, to its banks, bed, and waters. By the common law, in the absence of express limitations to the contrary, an owner of land immediately adjacent to a nonnavigable stream owns the bed of the stream *usque ad filum*, i.e., to the middle thread or centre of the stream. A riparian owner has the right to use the waters of a stream flowing through his land in any way and to any extent which does not inflict substantial damage on other riparian owners. In some of the United States this restricted common-law right of user has been enlarged so as to permit a riparian proprietor to make any reasonable use of the stream, even though such use involves detriment or damage to other riparian owners. The most effective remedy of a riparian owner where another makes an unreasonable or other unlawful use of the waters of the stream is by injunction, and this gives ample opportunity for a court of equity to consider all the circumstances. See ACCRETION; ALLUVION; FILUM AQUÆ; RIVER; WATER RIGHTS.

RIP'LEY. A town in Derbyshire, England, 10 miles northeast of Derby (Map: England, E 3). It has manufactures of silk and lace and mines of coal. Pop., 1901, 10,100; 1911, 11,848.

RIPLEY, ELEAZER WHEELOCK (1782–1839). An American soldier. He was born in Hanover, N. H., graduated at Dartmouth in 1800, and began the practice of law. After his removal to Portland, Me., he was one of the representatives of the district of Maine in the General Court of Massachusetts in 1810–11, serving as Speaker in the latter year, and in 1812 was elected to the State Senate. On the outbreak of the War of 1812 he entered the United States army as a lieutenant and by successive promotions became a brigadier general in April, 1814, and soon afterward, by brevet, a major general. He was wounded in the attack on York (now Toronto), Canada, led the Second Brigade of Gen. Jacob Brown's army in the battles of Chippewa and Lundy's Lane, and after the latter battle exercised the chief command. He occupied and fortified Fort Erie, distinguished himself in the defense of that fort on Aug. 15, 1814, and on September 17 was severely wounded while leading a sortie. (See FORT ERIE.) He resigned from the army in 1820, removed to New Orleans, La., practiced law there, was elected to the Louisiana Legislature, and from 1835 until his death was a member of Congress.

RIPLEY, GEORGE (1802–80). An American scholar and critic, born in Greenfield, Mass.

He graduated at Harvard in 1823, was an instructor there, studied theology, and was ordained in 1826. He remained in Boston until 1841, busying himself with philosophical speculations, was gradually drawn into the Transcendental circle, wrote on metaphysics and education, and did much to further the knowledge of continental literatures by a series of translations (*Foreign Standard Literature*, 14 vols., 1838–42). On leaving his pulpit he became a prime mover in the socialistic experiment of Brook Farm (q.v.). When this association failed (1847), Ripley went to Flatbush, L. I., and in 1848 he settled in New York City. He was the joint editor with C. A. Dana (q.v.) of *Appleton's New American Cyclopædia* (1857–63) and of the new edition of that work (1873–76). He also worked on the staff of the *Tribune*, chiefly as literary critic, and brought its reviews up to a high standard. He traveled much and became the centre of a brilliant literary circle, exerting thus a most genial and helpful influence. Indeed his importance lies more in what he inspired others to do than in what he himself accomplished. Consult O. B. Frothingham, *George Ripley*, in the "American Men of Letters Series" (Boston, 1882), and Lindsay Swift, *Brook Farm* (New York, 1900), containing a bibliography. See TRANSCENDENTALISM.

RIPLEY, JAMES WOLFE (1794–1870). An American soldier, born in Windham Co., Conn. He graduated at West Point in 1814, was commissioned second lieutenant of artillery, and took part in the defense of Sacketts Harbor. In 1817–18 he served under Jackson during the Seminole War and the invasion of Florida and in 1832–33 commanded the national forces in Charleston harbor at the time of the nullification (q.v.) movement in South Carolina. He was promoted captain (1832), major of ordnance (1838), and brevet lieutenant colonel (1848). In 1854 he was transferred to the Watertown Arsenal and in 1861 was commissioned brigadier general and appointed chief of ordnance of the army. As the Federal forces had then no heavy rifled cannon, he immediately ordered the conversion of old smoothbores and the manufacture of Parrott guns. From 1863 to the year of his death he was inspector of fortifications on the New England coast, having retired from active service. In 1865 he had been brevetted major general in the regular army.

RIPLEY, WILLIAM ZEBINA (1867–). An American economist, born at Medford, Mass. He graduated at the Massachusetts Institute of Technology in 1890 and three years later received the degree of Ph.D. at Columbia, where he was thereafter lecturer in sociology until 1901. He was also professor of economics in the Massachusetts Institute of Technology from 1895 to 1901, when he took a similar chair at Harvard. In that and the preceding year his services as expert agent on transportation were had by the United States Industrial Commission. Professor Ripley lectured at Columbia in 1915–16. His publications include: *A Financial History of Virginia, 1609–1776* (1893); *Races of Europe* (1899; new ed., 1910); *Trusts, Pools, and Corporations* (1905); *Railway Problems* (1907; rev. ed., 1913); *Railroads: Rates and Regulations* (1912); *Railroads: Finance and Organization* (1915).

RIPON, rĭp'on. An episcopal city in the West Riding of Yorkshire, England, 22 miles northwest of York (Map: England, E 2). The market place is spacious and has in its centre an obelisk 90 feet high. The cathedral, the oldest part of which dates from the twelfth century, is cruciform, measures 270 by 87 feet, and is surmounted by two uniform towers and also by a central tower. The Saxon crypt dates from the seventh century. Trinity Church is a fine cruciform edifice in early English. The principal industries are machine making, tanning, malting, and brass and iron founding. There are also several flour mills and varnish factories. Ripon was formerly noted for its woolen manufactures and for the "true steel of Ripon rowels" or spurs. The place received the name of Inhrypum from a monastery established in 660; in 678 it was created a see. It suffered from the Danes, Normans, and Scots and during the Civil War was occupied by the Parliamentarians, but was retaken by the Royalists in 1643. Pop., 1901, 8225; 1911, 8218.

RIPON. A city in Fond du Lac Co., Wis., 21 miles west by north of Fond du Lac, on the Chicago and Northwestern and the Chicago, Milwaukee, and St. Paul railroads (Map: Wisconsin, E 5). It is the seat of Ripon College (see RIPON COLLEGE), and has a public library. The centre of a productive agricultural region, Ripon has flouring mills, grain elevators, creameries, a woodworking factory, a washing-machine factory, knitting mills, pickling works, and glove and mitten manufactories. Ripon was settled in 1844 and incorporated in 1858. Pop., 1910, 3739.

RIPON, FREDERICK JOHN ROBINSON, first EARL OF (1782–1859). An English statesman. He was born in London, the son of Baron Grantham, and was educated at Harrow and at St. John's College, Cambridge. In 1806–26 he was a Conservative member of the House of Commons. He became Lord of Admiralty in 1810, Privy Councilor in 1812, and later the same year Vice President of the Board of Trade. In 1823 he was made Chancellor of the Exchequer and in that office carried through many important financial reforms, largely under the supervision of William Huskisson (q.v.). In 1827 he was made Viscount Goderich and became Premier, but retired the next year. He served in Lord Grey's cabinet (1830–34) as Colonial Secretary and was an advocate of the second Reform Bill (1831). In 1833 he became Lord Privy Seal and was created Earl of Ripon. In 1834 he hastened the fall of the cabinet by his resignation, and he continually attacked the financial policy of the Melbourne cabinet. In 1841 he was made President of the Board of Trade and in 1843 became President of the Board of Control of Indian affairs, from which he retired in 1846.

RIPON, GEORGE FREDERICK SAMUEL ROBINSON, first MARQUIS OF (1827–1909). A British administrator and statesman, son of the first Earl of Ripon (q.v.). He was born in London, was privately educated, and in 1849 became attaché to a diplomatic mission at Brussels. Actively interested in the Christian Socialist movement of which Frederick Denison Maurice (q.v.) was the head, he developed radical opinions. He was a Liberal member of the House of Commons for Huddersfield (1853–57) and for West Yorkshire (1857–59), then entered the House of Lords, and became Undersecretary for War (1859), for India (1861), Secretary for War and Privy Councilor (1863), and Secretary

of State for India (1866). In 1868–71 he was Lord President of the Council. In 1871 he was appointed chairman of the joint high commission on the Alabama Claims (q.v.). He resigned his position in the cabinet (1873) for reasons then unknown, but afterward found to concern his religious beliefs. Joining the Roman Catholic church in 1874, for six years he was engaged in religious work. In 1880, Gladstone having been returned to power, Ripon was appointed Governor-General of India. He adopted a firm and successful policy towards Afghanistan, but in his Indian administration departed from traditional practice by making the vernacular press free, by encouraging plans of native self-government, and by attempting to abolish all judicial qualifications for office based on race distinctions. Experience proved that Ripon's efforts, however well meant, were not suited to communities lacking political education. His policy nevertheless had and still has adherents who look forward to a more liberal participation of Indians in the government of their country. In 1886 he was First Lord of the Admiralty, Colonial Secretary in 1892 and 1894, and Lord Privy Seal in 1905–08. In 1871 he had been made Marquis.

RIPON COLLEGE. A coeducational, undenominational institution at Ripon, Wis., founded in 1851 as Brockway College and opened in 1853. The present name was assumed in 1863. It was founded by the Winnebago Convention of Presbyterian and Congregational churches. This convention relinquished control, giving it into the care of an independent board of trustees in 1868. In the college proper the A.B. degree is given on completion of four years' work in any of a number of groups of studies. There is also a conservatory of music. In 1915–16 there were 22 instructors and 249 students. The college has a library of 22,000 volumes, an endowment of $207,000, an income of $43,000, and six buildings valued, with the grounds, at $405,000. The president in 1915 was Silas Evans, LL.D.

RIPPERDA, rĕp-pĕr'dȧ, JOHN WILLIAM, BARON, later DUKE OF (1680–1737). A political adventurer, born in Groningen, Holland. At an early age he entered the Dutch army. In 1715 he became Ambassador to Madrid, where he turned Catholic. He was thereupon intrusted by the Spanish government with the direction of commerce and industry and became a favorite of King Philip V and his consort Elizabeth Farnese. In November, 1724, Ripperda went to Vienna and there concluded in 1725 a treaty of alliance between Spain and the Emperor Charles VI. Upon his return to Madrid in December, 1725, Ripperda was created Duke and made Prime Minister. But neither Spain nor Austria was able to fulfill the terms of the treaty, and in consequence Ripperda was dismissed from office on May 14, 1726. He feared for his life and fled to the palace of Stanhope, the English Ambassador, and disclosed diplomatic secrets. The Spanish authorities thereupon seized him and confined him in the citadel of Segovia. He escaped after two years, went to Holland, and became a Protestant again. After a life of adventure in several countries he appeared in the service of the Sultan of Morocco and became a devout Mohammedan. He led an army against Spain, but was defeated at Ceuta in 1733 and was exiled to Tetuân, where he died. Consult George Moore, *Lives of Cardinal Alberoni and the Duke of Ripperda* (2d ed., 2 vols., London, 1814), and Martin Philippson, *The Age of the European Balance of Power* (Eng. trans., Philadelphia, 1902).

RIPPLE MARKS. Undulatory marks seen on the sand of the seashore or on the surface of sand dunes and often on the surface of snowdrifts. Similar undulations also occur on soft bottoms at a depth of many feet beneath the surface of lake or sea water. In the former cases the ripple marks are produced essentially by the action of the wind, which is thrown into an undulatory motion by the slightest obstacle; when such motions are set up, the snow or sand that is carried by the wind is deposited in such a way that the ripples reproduce the movements of the air. At the bed of an ocean or lake the movement of the water may produce ripples by a precisely analogous process.

RIP VAN WINKLE. A character in one of the tales in Washington Irving's *Sketch Book* (1819), a good-natured, intemperate Dutchman, who sleeps for 20 years in the Catskill Mountains and, returning to his home, finds everything changed. The first dramatized form of the story was produced in 1828, followed by many others, until in 1866 Boucicault, with suggestions from Joseph Jefferson, produced the version which Jefferson made famous, first performed in London in 1865.

RIQUET, rē'kȧ', PIERRE PAUL DE (1604–80). A French engineer, born at Béziers. He conceived the project of the great Languedoc Canal connecting the Atlantic with the Mediterranean and brought this plan to the attention of Colbert (q.v.) in 1662. Colbert and Louis XIV both approving the project, work was begun in 1666, but was delayed from time to time by lack of funds. Riquet put his own fortune into the undertaking, contracted debts of more than 2,000,000 livres, and by his personal efforts raised further necessary funds. The canal was finished six months after Riquet's death by his son, at a total cost of about 16,000,000 livres (c.$6,500,000). Consult Samuel Smiles, *Lives of the Engineers* (London, new ed., 1904).

RIQUETI, GABRIEL HONORÉ. See MIRABEAU, G. H. RIQUETI, COUNT DE.

RISE OF THE DUTCH REPUBLIC, THE. A history of Holland by John Lothrop Motley (1856) from the abdication of Charles V in 1555 to the assassination of William of Orange in 1584.

RISHANGER, rĭsh'ăn-jĕr, WILLIAM (c.1250–c.1312). An English chronicler, born probably in Richangles in Suffolk. He joined the Benedictine monks of St. Albans Abbey about 1271. His chronicle, *Narratio de Bellis apud Lewes et Evesham,* continues the history of Matthew Paris and gives a valuable account of the Barons' Wars from 1258 until 1267, with high praise for Simon de Montfort. It was edited by J. O. Halliwell-Phillipps for the Camden Society in 1840. Other works credited to him include *Willelmi Rishanger Monachi S. Albani Chronica* (1272–1806), the last part of which he could not have written. It was edited by Riley for the "Rolls Series" in 1865.

RISHI, rī'shē; *Skt. pron.* r'shē (Skt. *rsi,* seer). The title given to the poets of the Vedic hymns, who were supposed to have received their divine inspiration through the sense of sight. The Sanskrit texts generally give seven as the number of these sages, although the Puranas (q.v.) mention nine, and Manu (q.v.)

enumerates ten. At a later period the term was applied to certain classes of ascetics. In the Hindu system of astronomy the seven rishis form the constellation of Ursa Major. Consult A. A. Macdonell, *History of Sanskrit Literature* (London, 1913).

RISING, Willard Bradley (1839–1910). An American chemist, born at Mechlenburg, N. Y. He graduated from Hamilton College in 1864 and studied also at the University of Michigan (M.E., 1867) and at Heidelberg (Ph.D., 1871). At the University of California he served as an instructor in chemistry in 1866–67, as professor of natural science in 1867–69, and as professor of chemistry from 1872 until his death. After 1885 he was also State analyst and acted as adviser and chemist to the State Board of Viticulture and State Board of Health. He was a member of the jury of award at the Chicago World's Fair in 1893 and at the Paris Exposition in 1900. Rising made important discoveries in thermal chemistry and conducted special researches in explosives.

RISING SUN, Order of the. A Japanese civil and military order with eight classes, founded by the Mikado Mutsuhito in 1875. The decoration consists of the national emblem, a rising sun composed of 32 white rays, with a central red medallion, and is suspended by green leaves and three blossoms of the *Paulownia* from a white ribbon edged with red.

RISK (OF., Fr. *risque*, Sp. *riesgo*, risk; probably connected with Sp. *risco*, steep rock, Lat. *resecare*, to cut off, from *re-*, back again, anew + *secare*, to cut). In insurance law, the particular peril or cause of loss which is specified in the contract of insurance and which accordingly is insured against. The expression has many other technical meanings in the law relating to insurance, such as the obligation of the insurer and the property or person which is the subject of the insurance. See Insurance.

The term is also employed in connection with the law of sales, both of real and personal property, to describe the chance that the goods may be destroyed before delivery. See Sale.

RISTIĆ, rĭs'tĭch, John (1831–99). A Servian statesman, born in Kraguyevats. He studied at Belgrade, Berlin, Heidelberg, and Paris and began his official career in the Ministry of the Interior, under Prince Alexander Karageorgevitch. In 1858 he was made secretary to the embassy sent to Constantinople by Milosh Obrenovitch and was Servian representative at the Porte (1861–67). In the latter year he was appointed Servian Minister of Foreign Affairs, and when Michael Obrenovitch was assassinated, he was the envoy sent from the provisional government at Belgrade to bring Prince Milan from Paris. From 1868 to 1872, during the minority of Prince Milan, he was a member of the Council of Regency. In 1872–73 he was Premier and Minister of Foreign Affairs. He held the same offices in 1875 and 1876–80. As such he guided the national policy during the wars with Turkey in 1876 and 1877–78, the ultimate result of which was that Servia secured absolute independence and added territory. He went out of office in 1880, but remained the leader of the Liberal party in the national Parliament and was an active supporter of a Pro-Russian policy. In 1887–88 he was once more Premier. Ristič was at the head of the regency from King Milan's abdication (1889) to King Alexander's assumption of power (1893). He was the author of several works on the foreign policy of Servia.

RISTORI, rē-stō'rē, Adelaide (1822–1906). A celebrated Italian tragic actress. She was born at Cividale del Friuli, Jan. 30, 1822, her parents being strolling players. At the age of 14 she was playing in *Francesca da Rimini*, and in a few years she became the leading Italian actress, a universal favorite because of her beauty and grace as well as her talents. Her marriage in 1846 with the Marquis Capranica del Grillo (who died in 1861) temporarily interrupted her dramatic career, but after two years she returned to the stage and appeared at Rome in Alfieri's tragedy of *Myrrha*. The French attack on the city caused her for a time to desert the theatre for the hospital, where she employed herself assiduously in nursing the wounded. After having acted for several years at Rome and Turin with immense success, she presented herself before a French audience in 1855, when Rachel was in the height of her fame, a proceeding considered as a challenge by the first Italian actress to the first French actress. Even in Paris she obtained a triumph, notably in Legouvé's *Medea*, which had been rejected by Rachel. Two of her other great rôles were Schiller's Mary Stuart and Giacometti's Elizabeth. In London, in 1856, she met with great success as Lady Macbeth. She visited the United States in 1866, 1875, and 1884–85. Ristori died Oct. 9, 1906, in Rome. Consult her autobiography, *Ricordi e studj artistici* (Turin, 1887; Eng. trans. by G. Mantellini, *Memoirs and Artistic Studies of Adelaide Ristori*, Garden City, N. Y., 1907).

RITARDANDO, rē'tär-dän'dō. A term in music, indicating that the passage to which it applies is to be played slower and slower, with a steady retard.

RITCH'EY, George Willis (1864–). An American astronomer, born at Tuppers Plains, Ohio. He attended the University of Cincinnati in 1883–84 and 1886–87 and was an assistant in the observatory there in the latter year. In 1888–96 he taught in the Chicago Manual Training School, was then optician (1896–99) and superintendent of instrument construction (1899–1904) at Yerkes Observatory, and instructor in practical astronomy (1901–04) and assistant professor of astronomy (1904–05) at the University of Chicago. In 1905–09 he served as astronomer and superintendent of instrument construction for the Solar Observatory of the Carnegie Institution and afterward was engaged in designing and constructing a 100-inch reflecting telescope.

RITCHIE, rĭch'ĭ, Alexander Hay (1822–95). An American engraver and painter, born in Glasgow, Scotland. He was a pupil of Sir William Allen in Edinburgh and came to New York in 1841, established an engraving business, and was elected to the National Academy in 1871. His plates, which show skill and delicacy, include: "Lady Washington's Reception Day," after Huntington; "On the March to the Sea," after Darley; "Death of Lincoln," after his own painting. He also engraved many portraits in mezzotint and painted in oil.

RITCHIE, Anna Cora Mowatt (1819–70). An American actress and writer. She was the daughter of S. G. Ogden, of New York, but was born at Bordeaux, France. She was married at 15 to James Mowatt, a New York lawyer. Before making her stage début in *The Lady of*

Lyons at the Park Theatre in 1845 she had been known as a reader. Later she toured with E. L. Davenport (q.v.) in the United States and went with him to England, where she appeared in 1847 in Manchester, then in London, and became Davenport's leading lady at the Marylebone Theatre. Her husband having died abroad, she returned to America and in 1853 retired from the stage. In 1854 she married W. F. Ritchie, editor of the Richmond *Examiner*. He died in 1868, and she thenceforth resided in England and was a correspondent of American newspapers. She was the author of several plays, among them *Fashion* (produced in 1845) and *Armand* (1847), and of a number of novels. Consult her *Autobiography of an Actress* (Boston, 1854).

RITCHIE, Lady Anne Isabella (1837–1919). An English author, the eldest daughter of William M. Thackeray. She was born in London and was educated in Paris. She married her cousin, Sir Richmond Ritchie, in 1877. Her works comprise novels and critical studies, written in a graceful, lucid style, which show skill in character drawing and which are full of discriminating touches and keen observation. They include: *The Story of Elizabeth* (1863); *Old Kensington* (1873); *Anne Evans* (1880); *Madame de Sévigné* (1881); *A Book of Sibyls* (1883); *Alfred Lord Tennyson and his Friends* (1893); *Blackstick Papers* (1908). She edited (1898) an admirable edition of her father's works, abounding, in its introductions, etc., in side lights on his personality. In 1911 she was appointed to the academic committee of the Royal Society of Literature.

RITCHIE, Charles Thomson, first Baron (1838–1906). An English statesman, born in Dundee. He became a well-known merchant in London, from 1874 to 1885 sat in Parliament for the Tower Hamlets as a Conservative, from 1885 to 1892 for St. George's-in-the-East, and from 1895 to 1905 for Croydon. In 1885–86 he was Secretary to the Admiralty, in 1886–92 President of the Local Government Board, and in 1895–1900 President of the Board of Trade. He became Secretary of State for the Home Department in 1900 and Chancellor of the Exchequer in 1902, which office he resigned the next year because of his opposition to Mr. Chamberlain's tariff views. He was made a peer in 1905.

RITCHIE, David George (1853–1903). A Scottish philosopher, born at Jedburgh and educated at Edinburgh University (1869–74) and at Balliol College, Oxford (1874–78). He was tutor at Jesus College (1881–94) and at Balliol (1882–86) and in 1894 became professor of logic and metaphysics at St. Andrews. For the year 1898–99 he was president of the Aristotelian Society. Ritchie contributed to Chambers's *Encyclopædia* and to Palgrave's *Dictionary of Political Economy,* edited *Early Letters of Jane Welsh Carlyle* (1889), and published *Darwinism and Politics* (1889; 4th ed., 1901); *Principles of State Interference* (1891; 2d ed., 1896); *Darwin and Hegel* (1893); *Natural Rights* (1895); *Political and Social Ethics* (1902); *Plato* (1902); *Philosophical Studies* (1905), edited with a memoir by Robert Latta.

RITCHIE, Thomas (1778–1854). An American journalist, born in Essex Co., Va. After studying medicine and doing some teaching he removed to Richmond and became editor of the *Examiner* in 1804. He changed its name to *Enquirer* and remained its editor and proprietor till 1845, when, at the request of President Polk, he gave it up to his sons and removed to Washington. There he founded the *Union* as the official organ of Polk's administration. In 1849 he retired and spent his last years in Richmond. He was a State-Rights Democrat and a born editor, full of pugnacity and Scottish stubbornness. He made the *Enquirer* a power in the land and was himself an important figure in contemporary politics.

RITCHIE, Sir William Johnstone (1813–92). A Canadian jurist. He was born in Annapolis, Nova Scotia, was educated at the Pictou Academy, removed to New Brunswick, and was called to the bar of that province in 1838. He represented the city of St. John in the Conservative interest in the Legislative Assembly in 1846–51, and in 1854–55 was a member of the Executive Council. He was appointed a puisne judge of the Supreme Court of New Brunswick in 1855, and 10 years later became Chief Justice of New Brunswick. Reëntering provincial politics, he was appointed Solicitor-General of Nova Scotia, and in 1866 was one of the Nova Scotia delegates to Britain to confer with the Imperial government in regard to Canadian Confederation. He was Chief Justice of the Supreme Court of Canada in 1879–92. In 1881 he was knighted.

RITE (Lat. *ritus,* custom; connected with Skt. *rīti,* way, usage, *ri,* to flow). A religious act performed according to an established order, determined by rule and usage. In most races the days when religious acts could be performed by any one in any way are long past. Many influences have tended to formalize worship. In savage races magical significance attaching to particular actions, the impressiveness of ceremony, the force of habit, and the sheer love of elaboration have combined to make rites elaborate. Instead of being the most simple savage rites are often among the most complex and exacting of religious forms. This is true among the Australians and certain African and American tribes. Rites furnish no measure of the degree of culture, for some of the lowest races, such as the Australians, possess the most exacting ritual.

Civilized races tend to drop barbaric rites but to develop those which are seemly and dignified. Since rites are molded by social custom the pomp and ceremony which surround the monarch are naturally reflected in the national religion. When the king is approached with formality the god must be approached with equal formality; therefore the elaboration of priesthood and ritual. Elaborate rites are natural and fitting in the national religion of a people with a formal court. When an individual religion arises, like that of the Hebrew prophets and of Christianity, where the relation between the worshiper and his god is intimate and personal, the reason for rite disappears. Personal religion is naturally informal. But the social expression of the religion may carry over from earlier religious stages an elaborate set of rites and may even develop new forms under the impulse of the emotional values of impressive form or the power of priestly prerogative. Thus, the Hebrew religion kept its old rites after the rise of the prophets, and Christianity partly borrowed and partly developed an elaborate ritual. Emphasis on individualism in religion always leads to a diminution of rite, as is illustrated by the greater informality of worship in Protestant bodies. See Liturgy.

Bibliography. Andrew Lang, *Myth, Ritual,*

and Religion (new ed., 2 vols., London, 1899); Spencer and Gillen, *Native Tribes of Central Australia* (ib., 1899); id., *Northern Tribes of Central Australia* (ib., 1904); A. W. Howitt, *Native Tribes of South-East Australia* (ib., 1904); Salomon Reinach, *Cultes, mythes, et religions* (Paris, 1905–08); G. B. Cutten, *The Psychological Phenomena of Christianity* (New York, 1908); Irving King, *The Development of Religion* (ib., 1910); E. S. Ames, *The Psychology of Religious Experience* (ib., 1910); John Roscoe, *The Baganda: An Account of their Native Customs and Beliefs* (London, 1911).

RITES, Congregation of. A committee of cardinals in the Roman Catholic church, founded by Pope Sixtus V (1585–90). It takes cognizance of the liturgy, the rites pertaining to the sacraments, the rubrics of the missal and breviary, the ceremonies of the Church in its public functions, in order to secure uniformity and reasonable consistency, and the canonization of saints. The congregation published an authentic revision of the decrees concerning rites in 1898–1900. Consult Bangen, *Die römische Curie* (Münster, 1854). See Roman Catholic Church, *Curia Romana.*

RITSCHEL, rĭch'el, Wilhelm (1864–). An American marine painter. He was born in Nuremberg, Bavaria, and studied at the Royal Academy of Munich under Kaulbach and Raupp. In 1895 he removed to the United States, settling in New York. Good examples of his marines, all of which display painstaking and sincere study of his chosen subject, are: "Hauling up the Boats" (1908); "Twilight at Sea" (1909); "Midsummer Night, Maine" (1912); "Rock-bound Coast, California" (1912); "Glory of the Morning, Pacific Coast" (1913). In 1914 he was elected a member of the National Academy of Design, at which he exhibited regularly.

RITSCHL, rĭch'l, Albrecht (1822–89). A German Protestant theologian, the founder of one of the most important schools of theological thought of the present time. He was born in Berlin. His boyhood was spent in Stettin, his father having been Bishop and general superintendent of the Evangelical church in Pomerania from 1827. He studied at Bonn, Halle, Heidelberg, and Tübingen. In 1846 he became docent at Bonn, professor extraordinary of theology in 1852, and full professor in 1859. In 1864 he was called to Göttingen, where he died, March 20, 1889. Ritschl ranks high both as an historian and as an exegete, but he is most widely known as a theologian. His theology was of the subjective type. He was filled with a desire to know the essence of Christianity apart from what he termed its accidents. Man and his spiritual needs became the centre of his system. He claimed that the first prerequisite of theological culture was a clear understanding of the Christian idea of reconciliation, and this, with the accompanying doctrine of justification, was at one time the burden of his teaching. Ritschl's most important publications were: *Die Entstehung der altkatholischen Kirche* (1850; 2d ed., 1857); *Ueber das Verhältnis des Bekenntnisses zur Kirche* (1854); *Die christliche Lehre von der Rechtfertigung und der Versöhnung* (1870–74; 3d ed., 1888–89; Eng. trans. of vol. i, 1872; of vol. iii, 1900); *Schleiermachers Reden über die Religion und ihre Nachwirkung auf die evangelische Kirche Deutschlands* (1874); *Unterricht in der christlichen Religion* (1875; 6th ed., 1903); *Geschichte des Pietismus* (1880–86); *Theologie und Metaphysik* (1881); *Fides Implicita* (1890). Two volumes of *Gesammelte Aufsätze* were published after his death (1893–96).

The **Ritschlian school** of theology grew out of, but does not uniformly reflect, the teaching of Ritschl. Strictly speaking, it is a movement rather than a school, for there is wide divergence of views among its members, and it has been aptly described as an organic evolution. It may be described from one point of view as Christianity apart from creeds and from another as theistic altruism. Its watchwords are: "Theology without metaphysics" and "From ethics to religion." Like Ritschl, it resents the metaphysical nomenclature in which the great Christian verities have been expressed, and claims that the only basis for religious knowledge is in the Scriptures, where God records Himself through Christ. The attempt to base religion upon natural theology and the proofs of reason is regarded as pagan and as coming from Greek philosophy. On the other hand, mysticism is equally rejected. Religion is a system of value judgments, the appreciation of the value of the love of God as shown through Christ. Christ may be called God and worshiped, since he shows God to us. It is neither necessary nor possible to prove religious values. They find a place in life without proof. The tendency of the movement is away from overdefining and in favor of great liberty and elasticity of thought and expression. The movement has been widespread and influential; its disciples have held chairs in the principal German universities; the spirit of their teaching has penetrated continental theology and made its influence felt widely in England and America.

Bibliography. The life of Ritschl has been written by his son, Otto Ritschl, professor at Bonn (Freiburg, 1892–96). Works treating of his teaching and the Ritschlian school are numerous; most of the following contain extensive bibliographies: Otto Pfleiderer, *Die Ritschlsche Theologie kritisch beleuchtet* (Brunswick, 1891); H. Schoen, *Les origines historiques de la théologie de Ritschl* (Paris, 1893); G. Mielke, *Das System Albrecht Ritschls* (Bonn, 1894); James Denney, *Studies in Theology* (London, 1894); G. Ecke, *Die theologische Schule A. Ritschls* (2 vols., Berlin, 1897–1904); James Orr, *The Ritschlian Theology and the Evangelical Faith* (New York, 1899); A. T. Swing, *The Theology of Albrecht Ritschl,* with *Instruction in the Christian Religion,* translated from the fourth German edition (ib., 1901); W. A. Brown, *The Essence of Christianity* (ib., 1902); A. E. Garvie, *The Ritschlian Theology, Critical and Constructive* (ib., 1902); J. R. Mozley, *Ritschlianism: An essay* (London, 1909); E. A. Edghill, *Faith and Fact: A Study of Ritschlianism* (New York, 1910).

RITSCHL, Friedrich Wilhelm (1806–76). A German classical scholar, born at Grossvargula, in Thuringia. He studied at Leipzig under Hermann and from 1826 to 1829 at Halle under Reisig. In 1833 he was called to Breslau as extraordinary professor. In 1834 he became professor, and he spent the winter and spring of 1836–37 on a tour through Italy and especially in a careful study of the Ambrosian palimpsest of Plautus at Milan. The results of this study he embodied in a letter to Hermann, a very important contribution to the understanding of Plautine prosody and metres. In 1839–65 he

was at Bonn as professor of classical literature and rhetoric, and in 1865–76 he was professor at Leipzig. He had extraordinary success as a teacher both at Bonn and at Leipzig. His first literary works were devoted to the Greek grammarians, as the edition of *Thomas Magister* (Halle, 1832), the treatise *De Oro et Orione* (1834), and the *Die Alexandrinischen Bibliotheken und die Sammlung der homerischen Gedichte durch Pisistratus* (1838) prove. In 1845, by his *Parerga zu Plautus*, he gained the name of *Sospitator Plauti*, savior of Plautus. But by far his greatest work is his edition of several plays of Plautus (1848–54). Subsequently he studied Latin inscriptions, with the view of illustrating the history of the Latin language, and published a long series of epigraphical studies, followed in 1862 by his monumental folio *Priscæ Latinitatis Monumenta Epigraphica*. His miscellaneous papers were collected in *Opuscula Philologica* (5 vols., 1867–79). His life has been written by L. Müller (Berlin, 1877) and by O. Ribbeck (2 vols., Leipzig, 1879–81). Consult also J. E. Sandys, *A History of Classical Scholarship*, vol. iii (Cambridge, 1908).

RITSCHL, Otto (1860–). A German theologian, son of Albrecht Ritschl. He was born in Bonn and was educated at the universities of Göttingen, Bonn, and Giessen. In 1889 he became professor at Kiel and in 1894 at Bonn, where he was director of the Seminar of Systematic Theology. He wrote a life of his father (1892–96), from whose theistic views his own differ in embracing determinism. Among the younger Ritschl's publications are: *Cyprian von Karthago* (1885); *Schleiermachers Stellung zum Christentum* (1888); *Ueber Werturteile* (1895); *Nietzsches Welt- und Lebensanschauung* (2d ed., 1899); *Wissenschaftliche Ethik* (1903); *Die freie Wissenschaft und der Idealismus auf den deutschen Universitäten* (1905); *Dogmengeschichte des Protestantismus* (1908–12).

RIT'SON, Joseph (1752–1803). An English antiquary, born at Stockton-on-Tees. He settled in London in 1775, studied law, and practiced as conveyancer. Afterward he was appointed high bailiff of the liberty of the Savoy (1784), a position he held for life. He was a man of learning, but of peculiar disposition, and a savage critic. Warton, Johnson, Steevens, Malone, Bishop Percy, Pinkerton, and others were the subjects of his bitter pen. His works include: *Observations on Warton's Three First Volumes of the History of English Poetry* (1782); *Cursory Criticisms* (1792); *Bibliographica Poetica: A Catalogue of English Poets of the XII–XVII Centuries* (1802); *Ancient English Metrical Romances* (1802); and several collections and anthologies. Consult Haslewood, *Some Account of the Life and Publications of the Late Joseph Ritson, Esq.* (London, 1824), and Nicholas, *Letters of Joseph Ritson, Esq., with a Memoir* (ib., 1833).

RIT'TENHOUSE, David (1732–96). An American astronomer and maker of astronomical instruments, born at Germantown, Pa. When 12 years old he inherited a small library containing a few works on mathematics and among them Newton's *Principia*. In 1751 he adopted clock making as a profession. He soon established a reputation as an astronomer and instrument maker of unusual ability, and in 1763 was engaged to determine the boundary line since known as Mason and Dixon's line. He was subsequently called upon to settle the boundaries between New York, New Jersey, Pennsylvania, and several other States. Soon after he made two orreries, one for Princeton College and one for the University of Pennsylvania. Rittenhouse was appointed by the American Philosophical Society to observe the transit of Venus, June 3, 1769. After 1770 he lived in Philadelphia, and was a member of the convention that framed the first State constitution. He also served as the first State Treasurer (1777–89) and director of the Philadelphia mint (1792–95). He was professor of astronomy in the University of Pennsylvania (1779–82), and was a member of many learned societies, including the American Academy of Arts and Sciences, the Royal Society of London, and the American Philosophical Society, of which he was president after Franklin's death (1791). Most of his scientific papers appeared in the *Transactions* of the American Philosophical Society. Consult the *Memoir* by William Barton (Philadelphia, 1813).

RIT'TER, Alexander (1833–96). A German composer, born at Narva (Russia). Having studied the violin with Franz Schubert at Dresden, in 1849, he entered the Leipzig Conservatory, where his teachers were David (violin) and Richter (composition). His marriage to a niece of Richard Wagner in 1854 brought him into close personal contact with Wagner and Liszt, and he became one of the most enthusiastic and active propagandists for their new style. The only position he ever held was that of conductor at the Stettin Opera (1856–58). When his friend Bülow became conductor of the Meiningen Orchestra in 1882, he joined the organization as one of the first violins. After Bülow's resignation in 1886 he moved to Munich, where he died. While in Meiningen Richard Strauss was strongly influenced by him; for it was Ritter who won the young composer away from the classicists to the banner of Wagner and Liszt. Of several operatic sketches Ritter completed only two, *Der faule Hans* (1885) and *Wem die Krone?* (1890), both of which met with considerable success. His most important works are his symphonic poems, *Seraphische Phantasie*, *Erotische Legende*, *Olaf's Hochzeitsreigen*, *Karfreitag und Frohnleichnam*, *Sursum Corda*, *Kaiser Rudolf's Ritt zum Grabe*. With these works he became the direct successor of Liszt. Consult S. von Hausegger, *Alexander Ritter* (Berlin, 1907).

RITTER, August Heinrich (1791–1869). A German historian of philosophy. He was born at Zerbst, Anhalt, studied theology and philosophy at Halle, Göttingen, and Berlin, and in 1824 was created professor extraordinarius at Berlin University. In 1833 he accepted a call to the university at Kiel, and went thence in 1837 to Göttingen. His great work, *Geschichte der Philosophie* (Hamburg, 1829–53; 2d ed., vols. i–iv, 1836–38), is still of value, as is also his *Historia Philosophiæ Græcæ*, Preller, joint author (Gotha, 1838; 8th ed., 1898). In addition he wrote works on logic, metaphysics, and ethics. Ritter was largely influenced by Schleiermacher.

RITTER, Frédéric Louis (1834–91). An American composer, born in Strassburg, Germany. He studied under Moritz, Hauser, and Schletterer. In 1856 he came to the United States, resided for some years in Cincinnati, where he founded the Cecilia and Philharmonic societies, and in 1861 removed to New York City and conducted the Sacred Harmonic and Arion

societies. In 1867 he organized a musical festival, which he conducted in New York, and was soon after appointed professor of music at Vassar College, which post he held till his death. He published many songs, orchestral, church, and pianoforte music, and several musical works, including *History of Music* (1870–74), *Music in England* (1883), and *Music in America* (1883). He died in Antwerp.

RITTER, Henry (1816–53). A genre painter, born at Montreal, Canada, but for most of his life a resident of Germany. He studied under Gröger in Hamburg and under Sohn at Düsseldorf. His anecdotic but naturally characterized episodes from the life of sailors and fishermen, showing the influence of Rudolf Jordan, were very popular. They include: "Offer of Marriage in Normandy" (1842, Leipzig Museum); "Drowned Son of the Pilot" (1844, Ravené Gallery, Berlin); "Poacher before Justice of the Peace" (1847), his largest painting; "Prairie Fire" (1851, Kunsthalle, Hamburg); "The Son's Last Letter" (1852, Kunsthalle, Bremen); "Middy's Sermon" (1853, Cologne Museum).

RITTER, Karl (1779–1859). A German geographer. He was born at Quedlinburg, Prussia, and was educated in the famous school of Salzmann at Schnepfenthal and at Halle University. After traveling widely he taught at Frankfort-on-the-Main and at Berlin. He was a member of the Royal Academy at Berlin. His earliest geographical studies were printed in a paper published for the young, and attracted wide attention. His six maps of Europe were published in 1806 and his *Geography of Europe*, in two volumes, five years later. In 1816 he completed in Berlin the first volume of *Die Erdkunde*, his monumental geographical work, and a part of it was published in the following year. The whole of the first volume did not appear until 1832, and the following volumes were issued from the press in rapid succession. *Die Erdkunde* is the fullest encyclopædia of geographical lore. In this work Ritter unfolded and established the treatment of geography, as a study and a science, which has been indorsed and adopted by all geographers. He presented the earth's surface in its relations to nature and to man and as the foundation of the study of the physical and historical sciences. All the physical geographies of to-day profoundly show the influence of Ritter's writings. His position as a teacher became as eminent as his rank as a geographer. Many of Ritter's writings were printed in the *Monatsberichte* of the Berlin Geographical Society and in the *Zeitschrift für allgemeine Erdkunde*. His *Geschichte der Erdkunde und der Entdeckungen* (1861; 2d ed., 1880), *Allgemeine Erdkunde* (1862), and *Europa* (1863) were published posthumously. Some of his works have been translated into English by W. L. Gage: *Comparative Geography* (1865) and *The Comparative Geography of Palestine and the Sinaitic Peninsula* (1866). Consult W. L. Gage, *Life of Carl Ritter* (New York, 1867), and Gustav Kramer, *Carl Ritter: ein Lebensbild* (2d ed., Halle, 1875).

RITTER, William Emerson (1856–). An American zoölogist, born at Hampden, Wis. He graduated in 1888 from the University of California, with the faculty of which he was connected after 1891, becoming professor of zoölogy in 1902. In 1893 he had taken the degree of Ph.D. at Harvard, and later he did advanced work at Naples and Berlin. He became director of the Scripps Institution for Biological Research and editor of the zoölogical publications of the University of California. Besides numerous papers contributed to zoölogical journals he published *War, Science, and Civilization* (1915).

RITTERSHAUS, rĭt'tẽrs-hous, Emil (1834–97). A German lyrist, born at Barmen. His poetry, marked by simple feeling, fine diction, and original matter, won great popularity. The best known of his works are: *Gedichte* (1856; 10th ed., 1906); *Am Rhein und beim Wein* (1884; 3d ed., 1893); *Buch der Leidenschaft* (1886; 4th ed., 1899); *In Bruderliebe und Brudertreue* (1893). Consult J. Rittershaus, *Emil Rittershaus* (Leipzig, 1899).

RIT'UAL (Lat. *ritualis*, relating to rites, from *ritus*, rite; connected with Skt. *riti*, course, custom, from *rī*, to flow). The name of one of the service books of the Roman church, in which are contained the prayers and order of ceremonial employed by priests in the administration of certain of the sacraments and other offices of the Church; in general, the services used in the missal and the breviary.

RIT'UALISM. In general, emphasis upon ceremonial in religion. In particular, a term popularly applied to the remarkable development of Church ceremonial which grew out of the Oxford movement (q.v.) and gathered about the service of the Holy Communion in the Church of England. The ritualistic movement may be said to date from 1863 or even earlier. There were Church riots in East London springing from this cause in 1859. The assertion of the doctrine of the Real Presence (see Lord's Supper) and its concomitant, the Eucharistic Sacrifice, resulted in a marked development of ceremonial. It is no exaggeration to say that a present-day high celebration of the Holy Eucharist in an advanced church is characterized by a detailed and elaborate ceremonial with which the earlier Tractarians had no acquaintance. The chief warrant for the new ritual is found in what is known as the Ornaments Rubric (q.v.) in the English Prayer Book. But the ritualistic, so called, find additional sanction for their ceremonial in the language of Canon xxx of 1603, which, they assert, establishes the unity of the Church of England with other branches of the Catholic Church and gives them the right to use all ceremonies which are primitive and catholic. They further contend that in the thirty-sixth article, on "The Consecration of Bishops and Ministers," it is expressly declared that the old Latin ordination services of the time of Edward VI contain nothing "superstitious or ungodly," that a celebration of the Holy Communion, according to the liturgy of 1549, formed an integral part of these ordination services, and that such a celebration involved the use of all sorts of pre-Reformation rites and ceremonies. They also cite in support of their practices the numerous lists of ornaments found in the ancient records of parish churches in Edward VI's time and the inventories taken by a commissioner appointed in 1552, which "specify a number of appliances and usages over and above those mentioned in the first Prayer Book of Edward VI." The result is the complete transformation of the Church's worship as it was celebrated in the middle of the nineteenth century. The six points of ritual are insisted upon. These are the eucharistic vestments (see Costume, Ecclesiastical); the eastward position for the celebrant at the altar, the use of un-

leavened or wafer bread, the mixed chalice, incense, and altar lights.

In 1867 the government appointed a commission "to inquire into the rubrics, orders, and directions for the regulation of the conduct of public worship." In 1874 the Public Worship Regulation Act was passed. Its object, as expressly declared by the Prime Minister, Disraeli, was to "put down ritualism," and its most significant provision was the appointment of a judge before whom ritual cases might be brought, with appeal to the Privy Council. In 1890, before Archbishop Benson and his episcopal assessors, Bishop King of Lincoln was tried for unlawful practices in the celebration of Holy Communion. The specifications were allowing two lighted candles on the altar, mixing water with the wine, assuming the eastward position, permitting the *Agnus Dei* to be sung, making the sign of the cross at the benediction, and taking part in a ceremonial ablution of the sacred vessels. On strict legal grounds all of these except the sign of the cross were upheld, at least with qualifications. An appeal was made to the Privy Council, which sustained the Archbishop. In 1899 the legality of the ceremonial use of lights and incense and the reservation of the Sacrament was argued before the archbishops of Canterbury and York, and the decision was adverse to the ancient practices.

But legislation has practically failed of its object. Several English clergy went to prison rather than obey the mandates of a secular court in things spiritual. The interference of the state in the teaching and practice of the church was resented and firmly resisted. Even the archbishops' decisions were held to be but opinions, and any weight attaching to them was deemed moral rather than legal. The movement, as represented by the English Church Union, under the leadership of Lord Halifax, has gone steadily on. The advanced school has been recognized by the government in the selection of a certain number of bishops from its ranks. The comprehensiveness of the national church has been admitted. Most of the practices in debate have been either explicitly or tacitly recognized.

In the American church the absence of any connection with the state has made the history altogether different. The controversy raged most hotly between 1865 and 1880, and numerous attempts were made to obtain definite legislation on the subject. In the absence of any detailed prescription in ritual matters, the advanced school contended that the law of the Church of England held good in her daughter church. In 1874 a canon was passed by the General Convention which made it the duty of the bishops to proceed against any minister accused of introducing unauthorized ceremonies or practices setting forth erroneous or doubtful doctrines, especially the elevation or adoration of the elements in Holy Communion and all other like acts not authorized by the rubrics of the Prayer Book. But the canon was practically a dead letter from the first, and, as in England, ritual observances which 50 years earlier would have raised a tempest of opposition are now common among the most moderate churchmen.

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RIU-KIU, rē-o͞o′ky o͞o′. See LUCHU.

RIVALS, THE. A comedy by Richard Brinsley Sheridan, produced Jan. 17, 1775. On its first representations it was almost a failure, but it has since held the stage more successfully than most eighteenth-century plays.

RIVAROL, rē′vȧ′rôl′, ANTOINE (1753–1801). A French writer and journalist, born at Bagnols. He went to Paris in 1780, where his personality and caustic wit soon gained him favor. In 1782 he wrote two *Lettres critiques* attacking the *Jardins* of Delille (q.v.) and in 1784 he published his most important work, *Discours sur l'universalité de la langue française*. His *Petit almanach de nos grands hommes* (1788) made scandalous disclosures. At the time of the Revolution he wrote on behalf of the Royalists, but in 1792 he emigrated to Brussels, where he wrote *Lettre à la noblesse française* and *La vie politique et privée de La Fayette*. He is remembered as the author of biting but excellent epigrams. His complete works were published in 1808. Consult A. Le Breton, *Rivarol, sa vie, ses idées, son talent* (1895).

RIVAS, rē′vȧs. The capital of the Department of Rivas, Nicaragua, 50 miles southeast of Managua (Map: Central America, E 5). It is the centre of a rich cacao-producing region, and manufactures and exports chocolate. It occupies the site of the ancient Indian town of Nicarao. Pop. (est.), 14,000.

RIVAS, ANGEL PÉREZ DE SAAVEDRA, third DUKE OF (1791–1865). A Spanish soldier, statesman, and poet, born in Cordova. He entered the army in 1807 and fought through the Spanish war of independence, retiring from the service in 1815. He participated in the revolution of 1820, was Secretary of the Cortes in 1821, and was forced to leave the country in 1823, residing in England, Italy, Malta, and France. He returned to Spain in 1834, inherited from his brother the ducal title of Rivas, and became Minister of the Interior in 1836. He was again forced into exile from 1837 to 1843. Then he was for five years Spanish Ambassador at Naples. He was afterward Ambassador at Paris (1856) and at Florence (1860). His fame as a national poet began in 1813 with the publication of *Ensayos poéticos*, and in due time he came to be recognized as one of the greatest leaders of the Romantic movement in Spain. Other works of his are the epics *Florinda* (1825) and *El moro expósito* (1834), the plays *Tanto vales cuanto*

tienes (1834), *Don Alvaro* (1835), and *La morisca de Alajuar* (1842), and the *Historia de la sublevación de Nápoles* (1848). His *Obras completas* (7 vols., *Colección de Escritores castellanos*, Madrid, 1894–1904) have been edited by his son. Consult Enrique Piñeyro, *Romanticismo en España* (Paris, 1904).

RIVE, Auguste Arthur de la. See De la Rive.

RIVE-DE-GIER, rēv'-de-zhē'ā'. A town in the Department of Loire, France, on the Gier, 19 miles southwest of Lyons (Map: France, S., J 3). It has ironworks, glassworks, and silk factories. Exports are facilitated by canal communication with Givors, on the Rhone. Its coal, once abundant, is now almost entirely worked out. Pop., 1901, 16,087; 1911, 15,663.

RIVER (OF. *riviere*, Fr. *rivière*, from ML. *riparia*, shore, river, fem. sing. of Lat. *riparius*, relating to a shore, from *ripa*, shore). A natural drainage line on the land, which, in addition to carrying off the surface water, always bears a load of mineral matter in suspension and solution. The water supply is derived from the rain or melting snow and from underground, whence it reaches the surface by seepage or in the form of springs. It is this latter source of supply which causes so many rivers to maintain their flow even when no rain has recently fallen. The load of mineral matter is obtained partly by solution in the passage of the water through the soil or rock, partly by the mechanical wearing or corrasion of the stream bed, and partly by the supplies furnished by the rain wash and weathering of the valley sides. In the course of this run-off the water forms a valley which varies in size and characteristics. Usually this valley is on the surface of the land, though occasionally beneath the surface, as in the Mammoth Cave of Kentucky.

Most rivers flow from higher country into lakes or into the sea, but in arid countries many streams terminate on the land because the river water sinks into the ground and evaporates. The western United States offers many illustrations of these conditions. In such arid regions the large rivers that are fed by a permanent supply from the mountains are often able to maintain their course across even desert regions. The Nile of Egypt and the Colorado of Utah and Arizona are illustrations of such rivers.

From the headwaters to the mouth a river has a slope which varies from one part to another. Ordinarily the steepest slope is near the head and the most gentle near the mouth, where the stream commonly flows quietly through a flood plain. This difference in slope is due to the fact that, in the normal development of its valley, a stream does its earliest and most effective work near the lower portion, where the volume is greatest, while the rills and creeks of the headwaters have had less time for their work. They also have less water with which to work, and, being higher, they have a greater task to perform in cutting down their slope. Hence the headwater streams may be vigorously at work excavating their valleys long after the lower course has been reduced to its profile of equilibrium, i.e., the easiest slope down which the river water with its sediment load may pass.

Let us imagine a new land for the first time exposed to the air. The rain that fell upon it would run off down the easiest slope and quickly carve a channel which would necessarily be steep-sided. Such a condition as this is illustrated in southern Florida, where the raised sea bottom is so level that the run-off is retarded and the rivers expand into many shallow lakes and swamp tracts. It is also illustrated on the coastal plains of Texas, where shallow, steep-sided valleys are cut in the soft strata of the low-lying plains.

At the same time that the river is rapidly excavating along its bed, the weather—rain, frost, etc.—is much more slowly attacking the valley walls; but so long as a stream can cut along its channel the deepening will proceed with much more rapidity than the widening. That is to say, the valley form will be that of a gorge. When, however, the stream has reached the limit of its power to cut vertically, i.e., when it has reached its base level, the slow process of broadening under the action of weathering, being in excess, reduces the slope of the valley walls. Therefore the river valley broadens out. Naturally the rate of broadening of a valley will vary according to many conditions, two of the most important of which are the nature of the rock and the climate. Many of the scenic features of river valleys depend upon the influence of rock structure in retarding or accelerating weathering. The Colorado Cañon of Utah and Arizona furnishes numerous examples of this, and it also stands as a type of the effect of climate in retarding valley development. The Colorado is topographically a young stream, but its valley is much less broad and much steeper than it would be had it been formed in a moist climate.

In the course of erosion a river excavates more rapidly in the soft than in the hard layers. It therefore locally so increases its slope as to introduce rapids or even falls in its course. The Niagara gorge and falls offer an excellent illustration of this phase. There are numerous other causes for waterfalls than this most common one; e.g., the two Yellowstone falls occur where two hard vertical dikes occur in the softer, partly decomposed lava. The Yosemite falls are apparently due to excavation of the main Yosemite valley by a glacier which passed down that valley; and in the Alps and the fiords of Norway falls of similar origin abound. Where lava flows have interfered with the stream courses waterfalls have resulted by the action of the river in excavating a new valley in the lava, as at the Shoshone Falls of Idaho and Spokane Falls of Washington.

The glacial interference with rivers is responsible also for the lakes which abound in northern Europe and America. It is to this cause that the peculiarities of the St. Lawrence system, by which there are alternate expansions of water and narrow river-like stretches, are due. The importance of these lake expanses of rivers is not confined to their usefulness in navigation; they also serve to regulate the flow of water. The rise of a few feet in a lake requires a long time for the corresponding discharge into the river to be completed. This checks the floods and furnishes an explanation of the fact that such a river as the main stream of the St. Lawrence system is free from destructive floods. A lake also acts as a filter to river water, and the outflowing stream is therefore practically free from all mineral load excepting that held in solution. By this means the river has its power of excavation greatly decreased, since the tools with which it works in corrasion are rock fragments in suspension. It thus happens that the

outlets of lakes are rarely deep valleys of erosion.

Ordinary rivers are subjected to variations in the depth of water and in the quantity of discharge per minute. With the rapid melting of the snow in spring, or at times of heavy rains, the volume of the river is greatly increased and its erosive power is very much greater than at ordinary times. In a large river with many branches a great rise is usually the result of the combination of marked increases in the volume of water supplied by numerous branches. At such times the river commonly rises until the channel is no longer able to hold it. Spreading out over the surrounding country, it floods the land, and, instead of a single thread of water, there may be a vast sheet miles in width, as in the case of the lower Mississippi valley. When the flood subsides a thin layer of sediment is left behind, and this, in the course of time, builds up a broad flat plain, known as the flood plain (q.v.), whose level is just below that of the level of the ordinary floods. The flood-plain soil is so fertile and productive that river flood plains are among the most densely populated parts of the earth, and for protection from the floods the people have found it necessary to build levees to confine the river to its channel. Such control of rivers cannot be made permanently successful, since the sediment that accumulates on the flood plain is then in part deposited in the channel, thus building it up. After a while, therefore, the river must leave its higher channel for the low ground to one side. It is because of the frequent changes of this sort in the Yellow River of China, accompanied by terrible destruction of life and property, that the Yellow River has been called China's Sorrow. See INUNDATION.

The flood plains of rivers often merge into a delta (q.v.). In fact, some flood-plain sections, as the lower Nile, were first built as deltas. Wherever a stream carries sediment into the sea the accumulation that settles tends to produce a delta, and if the coast line remains at a uniform level long enough, or if it is slowly rising, a delta will actually be built. But where the movement of the land is downward, or has recently been one of subsidence, deltas cannot be expected. This explains the absence of deltas in northeastern America and northwestern Europe and accounts for the many bays, estuaries, and fiords; for in these sections the lowering of the land has drowned the seaward ends of the valleys and transformed them into arms of the sea. Thus, the lower Hudson below Troy is for 150 miles an estuary and not a true river. The true Hudson is the portion from the Adirondacks to Troy, and that below may be called a tidal river.

By the mineral load which rivers carry important work is being performed. A large variety of alkalies and salts is held in solution and much of it is carried to the sea. It is the carbonate of lime obtained by the action of the water on the land that supplies the materials used by sea animals in the construction of their shells. This river load is therefore important in making possible the coral reefs of the present and the beds of limestone formed in ancient geological time. Since the river water carries small quantities of salt to the sea, and since it must be left behind when vapor rises into the air from the water surface, it seems probable that the saltness of the sea is due to this action of rivers. The mechanical burden of the stream is partly suspended in the river water, though immense quantities are pushed along the bottom in the form of fine silt, sand, gravel, and stones, according to the velocity of the water. Some of this is temporarily lodged in the quieter portions of the stream and, as we have seen, on the flood plains and deltas; but, since it is journeying towards the sea, much of it eventually reaches that goal, and there it is accumulated, often after being worked over and distributed by waves, tides, and currents.

It is estimated that 8,370,000 tons of mineral matter in solution are every year removed by running water from the surface of England and Wales. At this rate the surface of the country would be lowered 1 foot in 12,978 years as a result of solution alone. The Mississippi River carries in suspension or by dragging sediment to the amount of $\frac{1}{1500}$ of the total weight of the water. The river annually carries into the sea a quantity of mud which would make a prism 268 feet in height with a base of 1 square mile. About 150,000,000 tons of dissolved mineral matter are also annually carried into the sea through the Mississippi. See EROSION.

There is a battle in progress between the headwaters of opposing streams. The one that has the most rapid slope to the sea, or the greatest rainfall, or the softest rock to excavate, has an advantage over a less favorably situated opponent. It will push the divide back in consequence. Most often this is accomplished by a very slow backward eating, but occasionally a successful stream taps a large headwater of an opposing system and bodily leads it into its own drainage system. Such rivers have been called river pirates. It has apparently been by such headwater changes that the rivers which now cross the Appalachians through water gaps, like the Delaware, Susquehanna, and Potomac, have eaten their way back to the westward side of this mountain system.

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various articles in the *Report of the International Inland Navigation Congress* (The Hague, 1895); the *Report of the International Congress on Irrigation* (Paris, 1900); and the authorities referred to under the articles on the various rivers. See GEOGRAPHY; GEOLOGY; PHYSIOGRAPHY; ETC.

RIVER, NAVIGABLE. In the legal sense, either (1) a public river, i.e., one which by reason of its navigability by great ships is deemed the property of the state and not subject to private ownership, or (2) a river, whether publicly or privately owned, which is open to navigation by the public. The former use of the term is that which obtains at the common law, only rivers in which the tide ebbs and flows and which are therefore virtually arms of the sea being recognized as navigable rivers. The title to the bed of such rivers is vested in the crown or the state, and abutting private owners have no proprietary rights therein, nor indeed any special rights, other than such as pertain to them as members of the public, except the right of access thereto. Rivers navigable in this sense are subject to public use for various purposes, such as navigation, fishing, and the like. This use of the term "navigable" obtains also in the United States, but has there been extended to all great rivers, i.e., rivers navigable by ships of commerce, irrespective of whether they are subject to tidal flow or not.

In the second sense of the term "navigable" every stream subject to navigation by boats of any size or character, or even for floating logs, is in the United States held to be subject to public use for that purpose. But if the stream is not navigable in the larger sense and is therefore subject to private ownership, its use by the public is restricted to the purposes of such navigation. The owner of the fee of such a stream—usually the abutting proprietor—retains his exclusive rights to the fisheries, the water power, and other advantages of the stream, subject, however, to the public right of navigation. Consult: L. F. Vernon-Harcourt, *Treatise on Rivers and Canals* (2d ed., Oxford, 1882); J. M. Gould, *The Law of Waters* (3d ed., Chicago, 1900); H. P. Farnham, *Law of Water and Water Rights* (3 vols., Rochester, 1904). See BRIDGES, LAW RELATING TO; RIPARIAN RIGHTS; RIVER; WATERCOURSE.

RIVER BRETHREN, THE. The name applied to a group of Christian bodies supposed to be of Mennonite origin. They originated in a colony of Swiss who settled near the Susquehanna River in eastern Pennsylvania in 1750. The name is supposed to have been given to them because they baptized their first converts in this river. During the revival of 1770 congregations were formed among the converts, with Jacob Engle as their first pastor. In many points of their faith and practice the River Brethren resemble the Mennonites and in part also the Dunkards. They baptize by trine immersion, observe foot washing as a religious rite, use the kiss of greeting between persons of the same sex, teach nonresistance and nonconformity to the world, inculcate plainness in dress and living, abstain from political activity, although they do not neglect the regular duties of good citizens, are strict in the observance of the Sabbath, and endeavor to order their lives according to the precepts of the Bible. Three branches of the River Brethren are recognized: 1. *The Brethren in Christ* is the largest and has the most complete organization, with district conferences and a General Conference which meets annually. They are most numerous in Pennsylvania, Kansas, and Ohio, and have churches also in Illinois, Indiana, Iowa, Michigan, New York, and Canada. According to statistics available in 1914, they have in the United States 178 ministers, 68 churches, and 3731 communicants. *The Evangelical Visitor*, semimonthly (Harrisburg, Pa.), is the periodical organ of this church. The Brethren have missions in Buluwayo and the Transvaal, South Africa; the Baukuna district, Bengal, and the Poona district, India, in all of which 15 missionaries are engaged; and two missionaries at Hidalgo, Tex. 2. *The Old Order* or *Old Yorker Brethren* was constituted of churches which, on a division taking place in 1862, adhered to the original doctrine and practice. Most of these churches were in York Co., Pa., whence the name Old Yorker. Other churches are in Ohio, Indiana, and Iowa. 3. *The United Zion's Children* originated in a division which occurred in Dauphin Co., Pa., in 1853. Retaining the old confession of the Brethren unchanged, they differ from the other branches in certain matters of administrative and formal detail. Their churches are all in the State of Pennsylvania.

RIVER BULLHEAD. See MILLER'S-THUMB.

RIVER CRAB. A crab of the genus *Thelphusa*, inhabiting fresh water and having the carapace quadrilateral, the antennæ very short. One species (*Thelphusa depressa*), the grancio of the Italians, is very common in the south of Europe around the Mediterranean Sea. Other species are common in Palestine and other warm countries.

RIV'ERHEAD. A town and the county seat of Suffolk Co., N. Y., 74 miles east of New York City, on Great Peconic Bay and on the Long Island Railroad (Map: New York, C 2). It is in an agricultural region and manufactures carriages, cigars, and lumber products. The prominent structures include the county and the Historical Society buildings. Pop., 1900, 4503; 1910, 5345.

RIVER OF DOUBT. See RIO TÉODORO.

RIVER RAISIN, MASSACRE OF. See FRENCHTOWN.

RIVER ROUGE, rōōzh. A village in Wayne Co., Mich., about 6 miles south of Detroit, on the Detroit and Toledo Shore and the Michigan Central railroads (Map: Michigan, F 6). It has a shipyard and large bridge and steel works. Pop., 1900, 1748; 1910, 4163.

RIV'ERS. A title borne by three Englishmen prominent in the fifteenth century.—RICHARD WOODVILLE, the first Earl Rivers (?–1442), was a favorite of Henry V. The King appointed him Seneschal of Normandy; afterward he was chamberlain to the Regent, the Duke of Bedford, and lieutenant of Calais.—His son RICHARD (?–1469) married Jacquetta of Luxemburg, the widowed Duchess of Bedford, about 1436. He was a famous fighter and was created Baron Rivers in 1448. His politics were Lancastrian until 1461, when he joined the York side and acquired great influence by the marriage of his daughter Elizabeth to King Edward IV in 1464. He was made Constable of England in 1467. In his efforts to overthrow the Nevilles of Warwick, who represented the old nobility, he and one of his sons were captured and executed at Northampton in 1469.—His son ANTHONY, second Earl Rivers (c.1442–83), known as Baron Scales during his father's lifetime, shared all King Ed-

ward's diversities of fortune and remained his trusted friend after his return to power. At the King's death Gloucester, afterward Richard III, became Protector of the Kingdom. Actuated by desire to get possession of the person of the young King Edward V, Gloucester arrested Rivers, who was governor of the Prince, and he was beheaded on a charge of treasonable designs.

RIVERS, WILLIAM H. R. (?–1922). A British physiologist and anthropologist. He was educated at Tonbridge and at St. Bartholomew's Hospital. For a time he was lecturer on physiology at Guy's Hospital, was Croonian lecturer at the Royal College of Physicians in 1906, and became a fellow of St. John's College, Cambridge, and in the university served as lecturer on the physiology of the senses. In 1911 he held the presidency of the section for anthropology of the British Association. Rivers is author of *Todas* (1906); *The Influence of Alcohol and Other Drugs on Fatigue* (1908); an especially important *History of Melanesian Society* (2 vols., 1915); and several papers in *Reports of Cambridge Expedition to Torres Straits.* He was awarded a Royal medal by the Royal Society in 1915.

RIV'ERSIDE. A city and the county seat of Riverside Co., Cal., 57 miles east by south of Los Angeles, on the Santa Ana River, crossed near here by a huge concrete bridge, and on the Southern Pacific, the Atchison, Topeka, and Santa Fe, the Riverside, Rialto, and Pacific, the Pacific Electric, and the San Pedro, Los Angeles, and Salt Lake railroads (Map: California, H 9). It is noted for its beautiful streets and surrounding driveways through 20,000 acres of orange groves, particularly Magnolia and Victoria avenues and Huntington Boulevard. The city has a handsome courthouse, a Carnegie library, a State citrus experiment station, and a Federal Indian school that cost $500,000. Riverside is in the richest orange and lemon region in the country and ships 6000 carloads of oranges a year. An extensive trade is carried on also in Portland cement, which is manufactured here, and in poultry. The city was settled in 1870 and was incorporated in 1883. It has adopted the commission form of government. Pop., 1900, 7973; 1910, 15,212; 1915, 19,030; 1920, 19,341.

RIVES, rēvz, ALFRED LANDON (1830–1903). An American engineer, son of William Cabell Rives, United States Minister to France, born in Paris. He studied at the Virginia Military Institute and the University of Virginia and in 1854 graduated at the Paris Ecole des Ponts et Chaussées. He was assistant engineer on the Capitol building in Washington, worked on the Washington aqueduct and on governmental improvements of the Potomac River, and in the Civil War became colonel of engineers in the Confederate army. Then he became an engineer of the Chesapeake and Ohio Railroad, vice president and general manager of the Mobile and Ohio Railroad and afterward of the Richmond and Danville Railroad, and, after acting as superintendent of the Panama Railroad, was chief engineer of the Cape Cod Canal (q.v.) during early preparations for its construction. He was the father of Amélie Rives (q.v.), who became the Princess Troubetzkoy.

RIVES, AMÉLIE, PRINCESS TROUBETZKOY (1863–). An American author, daughter of A. L. Rives (q.v.). She was born in Richmond, Va., and began early to write stories, some of which were published in the *Atlantic Monthly.* In 1888 Miss Rives married J. A. Chanler of New York, from whom she was subsequently divorced. She then became (1896) the wife of Prince Pierre Troubetzkoy, a Russian. Her first collection of tales, published in 1888, was called *A Brother to Dragons, and Other Old-Time Stories.* This was followed by *Virginia of Virginia* (1888) and *The Witness of the Sun* (1889). In 1889 she created a marked sensation by *The Quick or the Dead* and in the same year published *Herod and Mariamne, a Drama,* in verse. Among her other works are: *According to St. John* (1891), a novel; *Barbara Dering* (1892); *Athelwold* (1893); *Tanis* (1893); *Seléné* (1905), a poem; *Augustine, the Man* (1906); *The Golden Rose* (1908); *Trix and Over-the-Moon* (1909); *Pan's Mountain* (1910); *Hidden House* (1911); *World's End* (1913); *Shadows of Flames* (1915).

RIVES, GEORGE LOCKHART (1849–). An American lawyer and historian, born in New York City. He was educated at Columbia (A.B., 1868; LL.B., 1873) and at Trinity College, Cambridge, England (M.A., 1879). Admitted to the bar in 1874, he practiced in New York, where he was a member of the Rapid Transit Railroad Commission from 1896 to 1902 and corporation counsel in 1902–04. In 1887–89 he was Assistant Secretary of State of the United States. A trustee of Columbia after 1882, he became chairman of the board in 1903. In 1915 he was elected to the American Academy of Arts and Letters, and in the same year became president of the Board of Trustees of the New York Public Library. He became widely known for his work *The United States and Mexico, 1821–1848* (2 vols., 1913).

RIVES, WILLIAM CABELL (1793–1868). An American political leader and diplomat, born in Nelson Co., Va. He was educated at Hampden-Sidney and William and Mary colleges and was admitted to the bar. He early became one of the prominent Democrats of Virginia, was a member of the State Constitutional Convention in 1816, of the State Legislature in 1817–19 and in 1822, and of Congress from 1823 to 1829. He was Minister to France from 1829 to 1832, when he was elected to the United States Senate, from which he resigned in 1834. He was reëlected in 1835 and remained in the Senate until 1845. He was again Minister to France from 1849 to 1853 and was a member of the Peace Conference at Washington in 1861 and afterward of the Confederate Provisional Congress and of the first and second regular Confederate congresses. He published an excellent *History of the Life and Times of James Madison* (3 vols., 1859–68); *The Life and Character of John Hampden* (1845); *Ethics of Christianity* (1855).

RIV'ET (OF. *rivet, rivect,* from OF., Fr. *river,* to clench, from Icel. *rifa,* to stitch together). A metal pin for connecting two plates of metal in boiler and tank making, steel shipbuilding, and steel bridge and structural work. To use the rivet it is heated, inserted in the punch or drill holes of the two plates, and the projecting unheaded end hammered to form a suitable head. The heading process may be performed by hand or by pneumatic percussive riveting machines, or by squeezing the rivets between the dies of pneumatic, steam, or hydraulic riveting machines. (See METAL-WORKING MACHINERY; PNEUMATIC TOOLS.) Small steel rivets are often headed when cold, and copper rivets and rivets of the other soft metals are never heated.

RIVETING MACHINES. See METAL-WORKING MACHINERY.

RIVIERA, rē′vē-ä′rȧ. The popular designation of the narrow but beautiful coast line of Italy and France, mainly around the Gulf of Genoa. The eastern half of the Riviera—Riviera di Levante—extends from Spezia to Genoa; the western half—Riviera di Ponente—from Genoa to Nice in France or as far as Hyères (Map: Italy, B 2, 3). The Riviera is distinguished by its magnificent scenery and by its mild climate, which each winter attracts thousands of sojourners of all classes, more especially to the numerous famous resorts along the west coast—Cannes, Nice, Mentone, Monte Carlo, San Remo, etc. The scenery is rather more bold and wildly picturesque on the east coast, and the vegetation is not so rich and attractive there as along the Ponente. Along the western Riviera from Nice to Genoa winds the celebrated Corniche road. The Riviera is occasionally visited by earthquakes, the last having been in 1887. Consult: C. Lenthérie, *The Riviera, Ancient and Modern* (Eng. trans. by Charles West, London, 1895); Sabine Baring-Gould, *A Book of the Riviera* (New York, 1906); William Scott, *The Riviera* (ib., 1907); G. C. Home, *Along the Rivieras of France and Italy* (ib., 1908).

RIVIÈRE, ALPHONSE ALFRED CLÉMENT LA. See LA RIVIÈRE, A. A. C.

RIVIÈRE, rē′vyâr′, BRITON (1840–1920). An English animal and figure painter, born in London. He was the son and pupil of William Rivière (1806–76), and first exhibited at the Academy in 1858. His early work was influenced by the Pre-Raphaelites; later he came under the spell of the Scottish landscape painters. He was elected a member of the Royal Academy in 1881. Rivière's specialty is animal subjects, often combined with characters from ancient history. He is perhaps more concerned with the dramatic and picturesque possibilities of animals than with their structure, but in power, simplicity, and poetic interpretation he is equaled only by Landseer. Among his most celebrated paintings are "Circe" (1871); "Daniel" (1872); "Sympathy" (1878) and "Miracle of the Gadarene Swine" (1883), both in the Tate Gallery; "Persepolis" (1878, his masterpiece); "In Manus Tuas Domine" (1879); "A Mighty Hunter before the Lord" (1891); "Beyond Man's Footsteps" (1894), Tate Gallery; "Hark, Hark the Lark" (1909). Consult the monograph by Armstrong (London, 1891).

RIVIÈRE, PAUL PIERRE MERCIER DE LA. See MERCIER DE LA RIVIÈRE, P. P.

RIVIÈRE DU LOUP, rē′vyâr′ dụ lo͞o (EN BAS). A town in Canada. See FRASERVILLE.

RIVIÈRE DU LOUP (EN HAUT). A town in Canada. See LOUISEVILLE.

RIVIÈRES DU SUD, dụ sụd. A French colonial possession in Africa. See FRENCH GUINEA.

RIV'INGTON, CHARLES (1688–1742). A British publisher, born in Chesterfield, Derbyshire. He early went to London and in 1711 took over the premises and business of Richard Chiswell, publisher and bookseller, having previously served an apprenticeship with the London bookseller Matthews. He became the leading publisher of theological books of his day. One of his 13 children was James Rivington (q.v.). The business after the father's death was carried on by his son John, who became publisher to the Church of England. Descendants entered the firm and kept the family name associated with the business till 1890, when it was absorbed by the Longmans. Beginning with 1897 there was again a Rivington & Company, at the head of which was Septimus Rivington, whose *The House of Rivington* (London, 1894) should be consulted.

RIVINGTON, JAMES (c.1724–1802). A New York Tory journalist of the Revolution. Rivington early acquired wealth as a bookseller in his birthplace (London), lost it at Newmarket, emigrated to Philadelphia (1760), and thence removed to New York (1761), where he had a bookshop in Wall Street. In 1773 he began to publish *The New York Gazetteer, or the Connecticut, New Jersey, Hudson River, and Quebec Weekly Advertiser,* bitterly attacking the Revolutionary movement and its leaders till Captain Isaac Sears, of the Sons of Liberty, came (1775) from Connecticut to New York with 75 horsemen, destroyed Rivington's press and cast his type into bullets. After a congressional investigation Rivington was permitted to return to his house, but he thought it wise to visit England, where he was appointed King's printer for New York, and returned thither in 1777 to publish *Rivington's New York Loyal Gazette,* a title presently changed to *Royal Gazette.* About 1781 Rivington turned spy for Washington and on the evacuation of New York changed the title of his paper to *Rivington's New York Gazette and Universal Advertiser,* but he had lost public confidence. His paper ceased to exist in 1783, and his declining years were passed in obscure poverty.

RIVOIRE, rē′vwär′, ANDRÉ (1872–). A French poet and dramatist, born at Vienne (Isère). He was one of the few poets who at the end of the nineteenth century was not influenced by the Symbolists (q.v.). His verse is characterized by grace and delicacy. He wrote *Les vierges,* with a preface by Sully-Prudhomme (1895); *Le songe d'amour* (1900; new ed., augmented, 1906); *Berthe aux grands pieds* (1899); *Le chemin de l'oubli* (1904), crowned by the Academy. His dramas include: *La peur de souffrir* (1899); *Il était une bergère* (1906); *Le bon roi Dagobert* (1908); *Mon ami Teddy* (1910), with Lucien Besnard. In English appeared *The Little Shepherdess* (1915).

RIVOLI, rē′vô-lē. A village in Italy in the Province of Verona, on the river Etsch (Map: Italy, C 2), 13 miles northwest of Verona, noted as the scene of a victory gained by Napoleon over the Austrians under Alvinczy, Jan. 14–15, 1797. His services in the battle gave Massena (q.v.) the title of Duke of Rivoli (1807).

RIVOLI, DUKE OF. See MASSENA, ANDRÉ.

RIVOLI, rē′vô′lē′, RUE DE. One of the most noted streets of Paris, running from the Place de la Concorde to the Rue Saint-Antoine. The western end of the street contains many of the most attractive shops of the city and is lined on the north side with arcades for several blocks, facing the Louvre and the Tuileries Gardens. It was begun in 1802, was completed in 1865, and received its name in honor of Napoleon's victory at Rivoli in 1797.

RIWARI. See REWARI.

RIX, JULIAN WALBRIDGE (1850–1903). An American landscape painter, born at Peacham,

Vt. He began to paint landscapes in 1875 and was self-taught, studying directly from nature. His subjects are chosen from all parts of America, and his treatment is remarkable for variety. Good examples of his work, all in private collections in Baltimore, New York, Rochester, and South Bethlehem, Pa., are: "Sunset, California Coast"; "High Tide, Coast of Maine"; "The Woodland Spring, Mike Marr's Camp, Moosehead, Maine"; "Breezy Afternoon"; "Solitude"; "Old Oaks"; "Twin Oaks"; "Noonday"; "A Breezy Day"; "St. John Harbor" (1903).

RIYAD, rē-äd′. A town of Arabia. See RIAD.

RIZAL, rē-säl′. A province of central Luzon, Philippine Islands (Map: Philippine Islands, C 3). It was formed in 1901 by the consolidation of the former provinces of Manila and Morong (the city of Manila being excluded as a separate municipality), and lies north and east of La Laguna and east of Manila Bay. Its area is 733 square miles. The northern part is mountainous and covered with forests; the southern portions are low and alluvial and subject to destructive floods from the Laguna. The province is traversed by the Pasig River. The chief agricultural product is the betel, but rice, sugar, corn, and tobacco are also raised. Pop., 1903, 150,923, almost wholly Tagalog. Capital, Pasig (q.v.).

RIZAL, José (1861–96). A Filipino patriot and writer. He was born at the pueblo of Calamba, Province of Laguna, Luzon, of Tagalog parentage, studied under the Jesuits at Manila, went to Madrid in 1882 for the purpose of studying medicine, received the degree of doctor of medicine and philosophy at the university there, and subsequently studied in Paris, Heidelberg, Leipzig, and Berlin, devoting his attention particularly to surgery, ethnology, linguistics, and philology. He acquired a more or less extensive knowledge of seven languages, became markedly proficient in optical surgery, and made a careful study of the history, institutions, and customs of various European countries. He early came to realize the disadvantages under which his race labored in the Philippines and the oppression to which it was subjected, and in 1886 published, in Spanish, a novel, *Noli Me Tangere*, in which he exposed and denounced the Spanish administration of the islands and in particular gave a startling picture of the alleged bigotry, rapacity, and cruelty of the religious orders. This book aroused the animosity of the Spanish officials, by whom Rizal was virtually forced to leave the islands within a few months after his return in 1887. Rizal then spent some time in Japan, London, and on the continent of Europe, and in 1891 published *El filibusterismo*, a sequel to *Noli Me Tangere*. Besides endeavoring to further the cause of his people by his writings, he was instrumental in organizing the Liga Filipina, which has for its objects the expulsion of the friars, the securing of the liberty of association and of the liberty of the press, and the obtaining of political concessions similar to those which have been granted to Cuba. The government in Luzon had rigidly prohibited the circulation of any of Rizal's writings, but in 1892 he ventured to return to Manila under a virtual promise from the Governor-General that he should be allowed to live there in safety. Upon his arrival, however, he was almost immediately arrested, was nominally convicted of having helped to organize the secret and revolutionary society called the Katipunan (q.v.), and banished to Dapitan, Mindanao. In 1896 he volunteered to act as a physician in Cuba, where a violent epidemic of yellow fever was raging, but was seized while on his way, was brought back to Manila, and there, after a mock trial, was shot Dec. 30, 1896, as a traitor. His influence among the Filipinos was enormous, and his abilities were such that he has been ranked by some writers as, in many respects, perhaps the ablest man the Malay race has produced. The novel *Noli Me Tangere* was translated into English by F. E. Gannett as *Friars and Filipinos* (New York, 1900) and by Charles Derbyshire as *The Social Cancer* (ib., 1912). A French translation was made by Henri Lucas and Ramon Sempau as *Au pays des moines* (Paris, 2d ed., 1899). Consult: Blumentritt, *Biography of Dr. José Rizal* (Eng. trans., Singapore, 1898); Clifford, "The Story of José Rizal, the Filipino," in *Blackwood's Magazine*, vol. clxxii (Edinburgh, 1902); and for an attempted justification of the Spanish officials, *La masonización de Filipinas: Rizal y su obra* (Barcelona, 1897).

RIZÄUS, rē-tsā′us. See HARDENBERG, ALBERT.

RIZZIO, rēt′sē-ō, or **RICCIO,** DAVID (c.1533–66). A favorite of Mary Stuart (q.v.), Queen of Scots. He was born near Turin, Italy, and went to Scotland in an embassy sent by the Duke of Savoy. As he possessed a good voice, the Queen selected him for the quartet in her private chapel. He rapidly rose in favor and in time became her secretary and chief counselor, but there is no proof that his relations with Mary were ever of a criminal nature or that he was a papal agent. Rizzio's haughty demeanor aroused the nobles, and they made use of the jealousy of Darnley, Mary's husband, to form a conspiracy for the purpose of killing the hated foreigner. The moving spirit of the affair was probably William Maitland, of Lethington, whom Rizzio had practically superseded as Secretary of State in 1565. The Protestant leaders also were glad to get rid of the Catholic favorite. On March 9, 1566, the conspirators broke into Mary's chamber in Holyrood Palace, Edinburgh, dragged out Rizzio, and murdered him. The Queen afterward, when she regained power, caused Rizzio to be buried with great honors. Consult Ruthven and Dirleton, *Murder of Rizzio from the Manuscript Accounts of Lord Ruthven* (Edinburgh, 1890).

RIZZO, rēt′sō, ANTONIO (c.1430–c.1498). An Italian sculptor and architect, born in Verona. He probably worked under the Mantegazzas at Certosa and about 1460 went to Venice, where he became the earliest pioneer of the Renaissance. In his nude figures of "Adam" and "Eve," in the court of the Doge's Palace, he equals the energetic realism of his Florentine contemporaries, but is more naïve and less refined than they. His clothed statues are rather in the manner of the Paduan school. The most important works ascribed to him are the tombs of the Doges Francisco Foscari (in part) and of Niccolò Tron (1473), both in the Frari, Venice. He was the engineer of the Republic in the war against the Turks and was afterward principal architect and rebuilt a portion of the Doge's Palace which had been destroyed by fire.

RO. See INTERNATIONAL LANGUAGE.

ROACH. See COCKROACH.

ROACH (OF. *roche, rosse,* Fr. *roche,* from MDutch *roch,* LG. *ruche,* Ger. *Roche,* AS. *reohhe,* Lat. *raja,* roach, ray). A small cyprinoid fish (*Leuciscus rutilus*) plentiful in the lakes and streams of northern Europe and similar to the bream (q.v.). It may exceed a foot in length. The upper parts are clear green, with blue reflections, the lower parts silvery white, and the fins reddish. It often gathers into large schools and is an angler's fish, but not much esteemed for the table. An American minnow, the golden shiner (*Abramis chrysoleucus*), is sometimes called roach. See Plate of DACE AND MINNOWS.

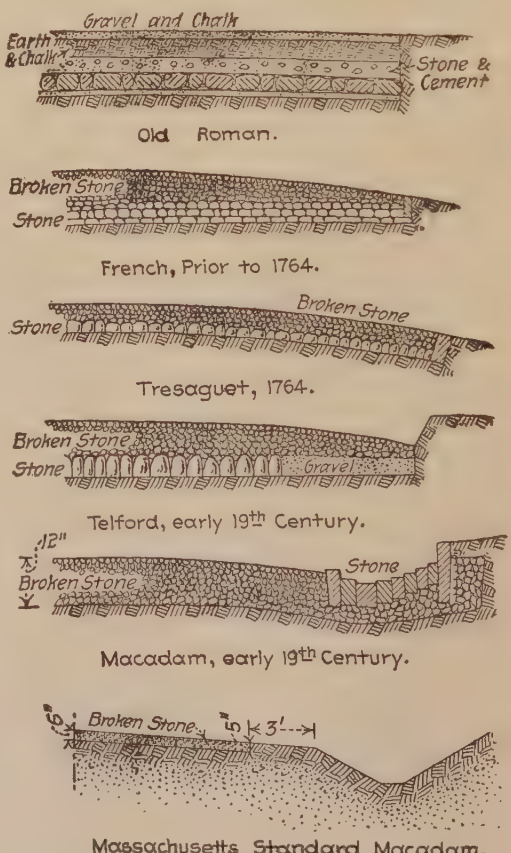
ROACH, JOHN (1815–87). An American shipbuilder, born at Mitchelstown, County Cork, Ireland. When 14 years of age he emigrated to America. After working in the Howell Iron Works in New Jersey he, with two fellow workmen, established a foundry near New York. Soon afterward he bought out his partners and in 1868 bought the Morgan Iron Works. Four years later he bought the Rainer shipyards at Chester, Pa., and soon became known as one of the foremost of American shipbuilders. Among the 114 iron ships constructed at his yards were several war vessels, including the *Chicago,* the *Atlanta,* the *Boston,* and the *Dolphin.* The rejection of this last vessel by the government in 1885 led him to make an assignment. The shipyards were soon reopened, however, under the management of his son, John B. Roach.

ROAD (AS. *rād,* from *rīdan,* OHG. *rītan,* Ger. *reiten,* to ride; connected with OIr. *ríad,* ride, Gall. *reda,* wagon). A way of communication by land between two or more points, generally for vehicular traffic. Roads have developed with commerce and travel and particularly with war, conquest, and military control of distant countries. Strabo mentions three great highways running out from ancient Babylon. The earliest systematic road making is credited to the Carthaginians, but the great road builders of olden times were the Romans. The Appian Way (q.v.), begun by Appius Claudius (312 B.C.), appears to have been the earliest notable piece of permanent road work. In general Roman roads were built in straight lines, regardless of ordinary grades, and were paved to a great depth, the several layers of stone and concrete sometimes aggregating 3 feet in thickness.

One of the earliest English road laws was passed by Parliament in 1285. It directed that all trees and shrubs be cut down to the distance of 200 feet on either side of roads between market towns, to prevent the concealment of robbers in them. The first toll for the repair of roads was levied by the authority of Edward III, in 1346, on roads which now form part of the streets of London. In 1555 an Act was passed requiring each parish to select two surveyors of highways to keep them in repair by compulsory labor; at a later period, in place of the compulsory labor, the statute labor tax was substituted.

In France Louis XII ordered an inspection of and report on the roads of the Kingdom in 1508, while late in the same century Henry IV appointed the Great Waywarden of France. In 1556 a stone road 15 feet wide was built from Paris to Orleans, with about 20 feet of unpaved public way on each side. France appears to have been the leader in modern road construction, but it was soon surpassed by England and gave up its own for the English macadam system of road improvements. By 1775 Tresaguet had evolved a system of improved road construction in many respects similar to that now widely used throughout the world. First of all Tresaguet prepared a curved bed, or earth foundation, for his stonework, parallel with and about 10 inches below the finished surface of the proposed roadway. Instead of laying his large stones flat he set them on edge, broke their upper edges off to an even surface, then covered this stone foundation with another hand-laid course of stone, smaller than the first and with its edges also hammered off. Finally he put on a third layer of stones, broken to about the size of an English walnut and spread by a shovel. The hardest stone was chosen for the surface layer. This general system was continued in France until 1820. In that year the plan worked out by Macadam in England was introduced in France, and in 1830 it was officially adopted in the latter country. It involved comparatively little change except in the foundation, as will be seen from the description of Macadam's work further on.

Macadam and Telford (qq.v.), whose names have been applied to the two rival systems of



THE DEVELOPMENT OF BROKEN-STONE ROADWAYS.

broken-stone road construction now practiced, were both Scotchmen, born within a year of each other (1756 and 1757, respectively). Although both of these great engineers built hun-

dreds of miles of broken-stone road construction on modifications of the French plans already described, Macadam departed further from his models. Telford retained the single course of large stone on edge introduced in France by Tresaguet, but he placed them on the bed of a level trench and secured a curved surface to his roadway by using larger, or taller, stones at the centre than at the sides. Over these large stones, in some cases, he spread a layer of gravel 1 inch deep; then he finished the roadway with about 6 inches of broken stone. Macadam used nothing but broken stone from the finished surface of the earth foundation, at the same time raising the stone bed above the earth at each side, instead of sinking it in a trench. The latter change was designed to facilitate drainage. Macadam's entire system was founded on perfect drainage and on the thorough compacting of the angular fragments of broken stone into one solid mass. See ROAD AND STREET MACHINERY.

Prior to 1800 there were few roads in the United States that deserved to be characterized as improved. In 1796 Francis Baily, in his *Journal of a Tour in Unsettled Parts of North America*, wrote that "there is at present but one turnpike road on the continent, which is between Lancaster and Philadelphia, a distance of 66 miles, and is a masterpiece of its kind; it is paved with stone the whole way and overlaid with gravel, so that it is never obstructed during the most severe season." The road was built by a company chartered in 1792. At the start it consisted of bowlders rolled in helter-skelter and filled between and above with earth and gravel. Heavy rains reduced the road to a dangerous condition. It is said that the road was afterward macadamized. This was only one of many toll roads distributed over the United States, but it is doubtful whether any of the other early ones could lay claim to having been macadamized. Another toll road, built in whole or in part before 1800, extended from the Shenandoah valley in Virginia westward to Kentucky. It was built and as late as 1895 it was said still to be owned by the Wilderness Turnpike Company. Although many attempts were made to secure road construction by the national government in the early days of the Constitution, the only such work of importance if not the sole example, was the National Road (see CUMBERLAND ROAD) from Cumberland, Md., westerly 800 miles to Vandalia, Ill. The original plan was to build a road from the Atlantic coast to the Ohio River. The road had a total width of 80 feet and was macadamized to a width of 30 feet. As settlement proceeded, *corduroy*, or log-surfaced roads, were built across dangerously wet and soft stretches, and with the advent of the saw mill, *plank roads*, particularly for the toll ways, became common in some sections. When new or when kept in good repair, plank roads were a vast improvement, but they were expensive to maintain and liable to get badly out of order.

After the wave of internal improvements had swept over the various States of the Union, or from, say, 1835–40 on, road construction generally became a purely local matter, except where turnpike companies built long stretches of toll roads. The advent of railways rapidly lessened the demand for extensive single lines of highways. "Working out the road tax," instead of paying the tax in money and having the money laid out by experienced road builders, was the rule, and poor roads were the result. The rapid increase in urban population, in general prosperity, and in municipal improvements which followed the Civil War was largely responsible for the beginning of improved city streets. These led to better roads, and from better roads it was only a step to the agitation for good roads that assumed such great proportions in the United States from about 1890 onward. This, in turn, was largely due to the widespread use of the bicycle and in more recent years of the motor vehicle.

Road Laws; Development of Good Roads. In 1889 a general county road law was passed by the New Jersey Legislature. This permitted counties, after certain legal formalities, to issue bonds for broken-stone or hard road construction and to assess one-third of the cost upon property abutting on the line of the road. In 1891 New Jersey passed a State Aid or State Highway Law, which was the beginning of systematic road improvement in the United States under the direction of State officials and with the aid of State funds. The law being defective, it was reënacted in 1892, and on December 27 of that year the State of New Jersey paid $20,662 to Middlesex County to help meet the cost of 10.55 miles of broken-stone roads. This was the first money paid by the State under the amended Act and the first direct State aid to the good-roads movement. Most of this work was done in the vicinity of New Brunswick and Plainfield. At first the Commonwealth was represented by the president of the State Board of Agriculture, but after May, 1894, the work was intrusted to an official known as the State Commissioner of Public Roads.

Under the original Act the cost was divided as follows: the State paid 33.3 per cent, abutting property owners 10 per cent, and the counties the remainder. The initiative was with the property owners. Eventually the demand for trunk lines led to the establishment of a continuous system of State roads. The cost of the improvement and maintenance of these is borne entirely by the State, and all work is planned and supervised by the State Highway Department. In addition certain county roads may be improved by State aid, the State paying 40 per cent of the cost, if the improvement is approved by the State Commissioner of Public Roads. These roads are maintained by the counties. The State road fund includes appropriations by the Legislature and the receipts from motor-vehicle licenses and fines. To the end of the year 1915 the State had expended about $8,500,000 for road improvements.

Massachusetts passed an Act in 1892 appointing a legislative committee to investigate the subject of road improvement. In 1893 it established a State Highway Commission of three members, but appropriations for construction were not made until the following year. Roads are improved by the State on petition of the local authorities, the State paying 75 per cent and the county 25 per cent. Also a certain sum is set aside each year for the direct assistance of the smaller and poorer towns. The Massachusetts law is more explicit in regard to maintenance than are State highway laws in general. Of the fund derived from motor-vehicle licenses 80 per cent must be expended

for maintenance, and special appropriations are made each year for the same purpose. The counties refund 25 per cent of the sum expended by the State for maintenance of State roads within their boundaries. Funds are derived from State bond issues, usually authorized to run five years, one-fifth of the total being issued each year. About $19,000,000 had been expended by the State to the end of 1915.

New York adopted State aid in 1898. After various changes in the scheme of organization the work was placed in charge of a single State Highway Commissioner, who appoints three Deputy Commissioners. There are four classes of roads: (1) State roads, improved and maintained wholly by the State; (2) county roads improved and maintained jointly by the State, county, and town; (3) county roads improved and maintained wholly by the counties; (4) town roads, improved and maintained by the towns, assisted by the State. A bond issue of $50,000,000 was authorized in 1906 for the improvement of a system of county roads aggregating 8380 miles, to which was subsequently added a system of State roads comprising 3617 miles. A second bond issue of $50,000,000 was authorized in 1912, of which $20,000,000 was for construction and maintenance of State roads and $30,000,000 for the completion of the county highway system. The apportionment of the funds among the counties is on the basis of population, mileage of roads outside of cities and villages, and the total area, each factor having a weight of one-third. The total sum expended by the State to the end of 1915 was approximately $97,000,000.

Ohio and Iowa enacted State-aid highway laws in 1904. Ohio has one State Highway Commissioner and three Deputy Commissioners. A system of main market roads is improved and maintained jointly by the State and the counties, and county and town roads are improved and maintained by the local authorities under State supervision. The total amount of State aid to the end of 1915 was about $8,500,000. Iowa has a State Highway Commission of three members. Road improvements are made by the counties under State supervision and advice. Main roads not exceeding 15 per cent of all roads in a county are improved and maintained as county roads; all others are town roads. The total expenditure of State funds had not exceeded $300,000 by the end of 1915.

In general the expenditure of State funds for road improvement throughout the United States has proceeded in accordance with one or all of the methods outlined above. The diversion of motor-vehicle fees to State road improvement is practically universal, and the distinction between State roads and State-aid roads is quite common.

The chronological order in which the States have taken up highway improvement follows: New Jersey, 1892; Massachusetts, 1893; Vermont, 1894; Connecticut and California, 1895; New York and Maryland, 1898; Maine and North Carolina, 1901; Rhode Island, 1902; Pennsylvania, New Hampshire, and Delaware, 1903; Ohio and Iowa, 1904; Illinois, Minnesota, Michigan, Idaho, and Washington, 1905; Virginia, 1906; Missouri, 1907; Georgia, 1908; Arizona, Colorado, New Mexico, North Dakota, Utah, and West Virginia, 1909; Louisiana, 1910; Alabama, Kansas, Nebraska, Oklahoma, Nevada, South Dakota, Wisconsin, and Wyoming, 1911; Kentucky, 1912; Arkansas, Montana, and Oregon, 1913; Florida and Tennessee, 1915. Indiana, Mississippi, South Carolina, and Texas to the year 1915 had made no provision for State-aid road improvement.

There is much variety both in the manner of giving State aid and in the sums given. For instance, in California the Advisory Board of the State Department of Engineering has general supervision of road work. A subdivision of the board is designated the State Highway Commission. The State may assist in the improvement of any road of State importance, but under the Act of 1910 a specific sum was provided for the improvement of a system of State roads, which in a general way is defined in the Act. This system is constructed and maintained wholly by the State, but the counties refund a part of the cost in small yearly installments. Funds are derived from bond issues and by special appropriation, amounting in all by the end of 1915 to about $15,000,000. Missouri has established the office of State Highway Commissioner. There is a State stamp tax on certain documents, the proceeds of which are divided among the counties in proportion to the number of school children. Special appropriations are made for dragging roads. The amount of State aid to the end of 1915 was about $1,500,000. Georgia has a law for utilizing convict labor on roads, but it has no State Highway Department nor does it otherwise take part in road improvement. Delaware has a State Highway Commissioner for one county only. Alabama has a State Highway Commission of five members. Roads are improved jointly by the State and the counties, each paying one-half the cost; to the end of 1915 the total sum expended by the State was about $500,000. Kansas gives no money for construction, but it has a State Engineer, a part of whose duty it is to furnish plans, specifications, and advice. Nebraska has a State Board of Irrigation, which gives assistance on highway bridge work and gives advice on road work. Oklahoma has a single State Highway Commissioner, whose duty it is to give advice, plans, and specifications. Nevada has a State Engineer, who has charge of State-aid road work, but no large appropriations have been made. South Dakota has a State Highway Commission of three members, but its function is merely to give advice. Wisconsin has a chief Engineer of the State, who has general supervision of road improvement. Selected county roads may be improved jointly by the State, county, and town, each paying one-third the cost. Specifications and plans are furnished by the State Highway Department. The roads are maintained by the counties. About $4,000,000 of State-aid funds had been expended to the end of 1915. Wyoming has a State Engineer and a system of roads improved by the labor of convicts. In a number of States, as in Nebraska and South Dakota, the highway commissioners are empowered to act merely in an advisory capacity.

In the United States as a whole about $256,000,000 has been spent to the end of 1915 by the States for road improvement, and the sum expended annually has reached about $50,000,000. To these sums local road authorities have added at least 25 per cent more.

The Office of Public Roads, United States Department of Agriculture, was established in

1893, when an appropriation of $10,000 was made for the purpose of making inquiries in regard to systems of road management, methods of road making, and to publish and distribute information on these subjects. This bureau has been steadily increasing in importance. It has a well-equipped laboratory for testing rocks and other road-making materials, and its staff of engineers supervises the construction of experimental and model roads in various parts of the country and gives advice to local road authorities. In 1915 this bureau and others were consolidated under the name of the Office of Public Roads and Rural Engineering.

The essentials of good roads are: (1) proper location; (2) easy grades; (3) a smooth, hard, durable wearing surface. In the case of new roads there is little or no excuse for poor location and no danger of it if the advice of a good road engineer is sought and followed. Ideal grades should not exceed a rise of 1 foot in 33⅓ of horizontal distance, which is known as a 3 per cent grade. Telford allowed a rise of 1 in 30, and French engineers permit 1 in 20, but this is for smooth broken-stone roads.

The only classes of wearing surface for improved roads considered in this article are earth, gravel, and macadam. (For wood, brick, and stone block, sheet and block asphalt, bituminous concrete, cement concrete, etc., see PAVEMENT.)

The ordinary dirt road, when surfaced with a proper mixture of sand and clay, or topsoil, kept smooth and hard by frequent use of a road drag, and well drained, makes a very serviceable roadway throughout all the year, with the possible exception of the early spring months. This type of road has been the subject of considerable engineering study, and for many parts of the country it is probably the only economical type. About one-sixth of the total 30,000 miles of State-aid roads in the United States in 1915 were of the sand-clay type. Nearly one-half the total came under the classification of gravel roads, which are one step higher in the scale than sand-clay roads. Good gravel roads can be built for $2500 to $4000 a mile, and the cost of maintaining them generally does not exceed $250 a mile per year. In many instances these roads may be built of bank-run gravel, but generally a certain proportion of sand and clay or loam is mixed with the gravel to give the mixture the necessary binding qualities.

Macadam roads are similar in most respects to gravel roads. Instead of small pieces of stone in the form of pebbles and natural fragments, artificially produced fragments are used, and instead of sand and loam, rock dust is employed as the binding material. The broken stone is placed in layers and rolled with heavy steam road rollers. (See ROAD AND STREET MACHINERY.) After applying the finer stones and dust the road is thoroughly sprinkled with water before final rolling, which helps to compact the road surface and is essential to the cementation process of binding the pieces of stone and dust into a solid mass. This use of water in the building of macadam roads has given rise to the term "water-bound" macadam in contradistinction to the newer types of "bituminous" macadam, in which an asphaltic or tar binding material is used either in place of or in addition to the rock dust.

Many gravel and water-bound macadam roads, either immediately after completion or subsequently, are treated with a surface coating of liquid bituminous binder, sprinkled over with a layer of sand or stone chips. When once so treated they become bituminous macadam pavements to all practical purposes. (See PAVEMENT.) Both gravel and water-bound macadam roads require ceaseless vigilance in maintenance, and without this they rapidly go to pieces under motor-vehicle traffic. The pneumatic tires of motor vehicles appear to be very destructive, especially in dry weather, by drawing out the dust binding material and causing the surface to "ravel." To prevent this disintegration there are hosts of materials, both patented and unpatented, to be applied to road surfaces, varying all the way from common salt and calcium chloride to the many bituminous compounds. Such materials are Dustoline, Glutrine, Rocmac, and numerous petroleum and tar products. These road materials may be divided into two general classes, dust layers and road binders. The first are intended to hold the dust in the road by keeping the surface damp (as in the case of salt and calcium chloride) or by the capillary attraction of an oily liquid. The second, the road binders, have such adhesive or cementing qualities as to replace the dust as a binder and keep the road surface intact. See PAVEMENT; ROAD AND STREET MACHINERY; STREET.

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ROAD, IN LAW. See HIGHWAY.

ROAD, LAW OF THE. See RULES OF THE ROAD.

ROAD AND STREET MACHINERY. Various implements, other than hand tools, used in constructing and maintaining roads and streets, with the exception of such apparatus as is peculiar to the construction of bituminous pavements. (See PAVEMENT.) Ordinary plows and scrapers for loosening and moving the

natural earth surface in the preparation of the roadbed need no extended description. Scrapers of this sort are either drag or wheel, according to whether their bottoms rest on the surface of the earth when their loads are being moved or whether the whole scraper is mounted on and conveyed between two wheels. There is another class of scraper, more properly called a road machine, which consists of a long inclined blade, generally of steel, mounted diagonally between two pairs of wheels, and capable of vertical adjustment so as to vary its cutting depth and also permit it to conform to the angle of the road surface. These machines are drawn by horses and throw the earth from the side towards the centre of the road. Another machine used in road construction is known as a grader, or grader and ditcher. It loosens the earth by means of a plow mounted between two sets of wheels, lifts it on to a converging belt, and dumps it into the roadway, the waste banks at the side, or into a wagon for removal.

Road Rollers are largely used to compact roads formed by embankments; to solidify roadbeds whether in cut or fill, in order to give as unyielding a foundation as possible to surfacing of more durable material; and finally for compressing broken stone or asphalt and for bringing the various classes of block pavements to a firm bed and regular surface. Rollers may be either steam or motor drawn or horse drawn and consist of one or more revolving hollow iron cylinders, resembling very broad wheels, mounted on an axis. The weight of rollers ranges from 2½ to 20 tons, steam rollers being the heaviest.

Stone or Rock Crushers are used to break stone into small sizes for macadam or the upper portion of telford roads and for use in preparing concrete. (See GRINDING, CRUSHING, AND PULVERIZING MACHINERY.) Screens are for separating broken stone into various sizes. (See ORE DRESSING.) Further operations connected with getting out stone for road work are treated under QUARRY, QUARRYING. Stone spreaders are used to distribute broken stone in layers of regular thickness on road surfaces. The machine consists of a wagon, on which is mounted a box whose forward end may be raised to give the bottom any desired slope, and of a trailing box reaching to the ground, having a scraper attached to its bottom and rear. By adjusting this scraper the depth of the stone may be regulated at will.

Sprinklers are used to moisten earth and stone used in road construction and to lay the dust on completed streets. Their most common form is a cylindrical tank, mounted on four wheels and with the sprinkler proper attached to the rear of the wagon. The sprinkler is a perforated tube or tubes, adjusted to throw the water out in a spray or shower at the rear and sides. The use of heavy oils and bituminous binders on macadam roads has given rise to the development of many devices for sprinkling or spraying the road with these materials. Some of these sprinklers are equipped with steam boilers and air compressors for heating the material and forcing it through the spraying nozzles.

Scrapers for Cleaning Streets are employed to remove stiff mud from roads and streets, and particularly from broken-stone roads. They consist of a series of steel or iron teeth, or long curved blades 3 to 5 inches wide, attached to a framework in such a manner that they will yield to and pass over irregularities in road and street surfaces without tearing up the stone or other material. They pile up the mud at one side.

Street Sweepers of many types are employed to collect street dust and dirt for removal. Most of them consist of a revolving broom, mounted diagonally beneath and at the rear of a four-wheeled truck. The ordinary sweepers throw the dirt out to one side, in a continuous heap or row. In recent years various pick-up sweepers have been invented and to a rather limited extent introduced. Most of them throw the dirt on to a conveyor actuated by the revolutions of the axis of the wagon, and one type picks up the dirt by means of an exhaust fan, driven by an engine mounted on the machine. Nearly all the sweeping machines are drawn by horses, including the one just described, but self-propelled sweepers are also in use.

Scarifiers, for loosening the surface of macadamized roads prior to resurfacing, are used quite extensively in England. They consist of teeth, tines, or drills, attached to a special machine or to a road roller in such a way as to tear up the surface to a slight depth by actions similar to plowing, drilling, or hammer blows, according to the machine. In the United States the same end is attained by fastening spikes to steam road rollers or by means of specially shaped plows.

The use of broken stone for road surfaces depends very largely upon the development and use of two of the classes of machinery described in this article, road rollers and stone crushers. The first practical road roller was made in France in 1787 by M. de Cessart, Inspector General of Bridges and Roads. It was made of cast iron, was 3 feet in diameter and 8 feet wide. In 1817 a road roller was patented in England by Philip H. Clay, and in 1825 another English patent on a road roller was granted to John Biddle. Various writers place the beginnings of the continuous use of road rollers in both France and England during the period 1830–40. Some credit the French engineers with being pioneers in this respect in 1820. Steam road rollers, which have now largely replaced horse rollers where the use of the former is feasible, were first patented in France early in 1859 by Louis Lemoine, of Bordeaux. A roller weighing 10 long tons (22,400 pounds) was immediately built. It was used in Bordeaux, and in 1860 it was also used in Paris. In 1863 W. Clark, of Calcutta, India, and W. F. Batho, of Birmingham, England, patented a steam road roller, and in 1864 a machine built after their patent was shipped from Birmingham to Calcutta. Several other rollers of this type followed in England, and eventually machines of one form or other came into extensive use. (See GRINDING, CRUSHING, AND PULVERIZING MACHINERY; ORE DRESSING; PAVEMENT; QUARRY, QUARRYING; ROAD. Consult A. T. Byrne, *Treatise on Highway Construction* (5th ed., New York, 1907); Thomas Aitken, *Roadmaking and Maintenance* (2d ed., Philadelphia, 1907); Blanchard and Drowne, *Text-Book on Highway Engineering* (New York, 1913).

ROAD RUNNER. A curious and interesting ground cuckoo (*Geococcyx californianus*) of the southwestern United States, also called

chaparral cock, snake killer, and paisano. It is nearly 2 feet long, of which the tail is about one-half. The plumage is bronzy or coppery green, changing to dark steel blue on the head, everywhere except on the rump streaked with white or tawny; underparts soiled whitish, streaked with black on the throat, breast, and sides. The road runner is notable for its swiftness of foot, for, aided by its wings, it is said to equal the speed of a horse. It is almost omnivorous, but reptiles and mollusks form a large part of its diet. The nest is a flimsy structure of twigs in a bush, and the white eggs are six to nine in number. Like other cuckoos the incubation begins as soon as one egg is laid, so that fresh eggs and young birds may be found in the same nest. It is said that road runners can be domesticated and then make very interesting pets. Another species (*Geococcyx affinis*) inhabits southern Mexico and Guatemala. See Plate of CUCKOOS.

ROADS AND RAILROADS, MILITARY. Military roads are of two general classes: first, those incidental to the development of a new country, as in the case of many roads constructed by the army during the development of the western and central portion of the United States and such as are now being constructed in the Philippines and Alaska. The largest and most important of these was the old National Road from Cumberland, Md., through Maryland, Pennsylvania, West Virginia, and Ohio into Illinois. (See CUMBERLAND ROAD.) Many of the best roads of Europe were also first built as military roads. Frequently their main object is to keep up a line of communication for the supply of permanent garrisons in time of peace. The second class comprises roads incident to the active operations of an army in war time. Such are roads which furnish communication to and between different parts of camps and fighting lines where they are used for periods of from several days to months. These should be adapted to the service and may vary from country roads to oiled macadam and even to paved roads. Such also are roads necessary for the movement of an army and used possibly for a single occasion of a few days' duration. There are many examples of work of this kind by the army in the Civil War. Some generals organized pioneer companies in each regiment whose special duty it was to keep the roads and bridges in proper shape for the movement of the army.

Work of this kind even under modern conditions consists generally in such repairs to existing dirt roads as will make them capable of standing the passage of a large body of troops with its trains, and makeshift methods are followed that would not be tolerated under other circumstances. Frequently tolerable results are secured by placing on the roads brush, cornstalks, and similar material bound together sufficiently to permit of temporary use, but which eventually probably leave the road in as bad condition as before repair. A favorite method is to corduroy the road by cutting down trees and saplings, laying a line of logs parallel to the axis of the road and covering them with small saplings placed across the road. These are fastened down and, if time affords, smoothed on top or covered with dirt. Brush is sometimes bound together in bundles and used in lieu of saplings.

Where sawed timber can be procured roads have been planked in the same manner. Much of this class of work was done by Sherman's army in marching northward from Savannah in the Civil War. It is evident that the method of repair of a road under such circumstances must depend almost entirely on the material at hand. If a soil is too muddy, sand is sometimes added; and if too sandy, conversely clay is added, approximating in either case a sand-clay road. It is usually out of the question to metal the road, as is done in macadamized roads for regular use. Gravel is sometimes at hand and can be used for the purpose. In view of the temporary character of military roads greater slopes are permissible than in permanent roads. If the road is not made wide enough to permit the passage of vehicles at all points, turnouts for this purpose should be established at convenient intervals. The supervision and construction of military roads in war time are normally handled by the pioneer engineer troops. It is a trite saying that an army marches on its stomach, and the stomach of the army is vitally dependent on its roads. Where time affords they should be carefully constructed according to approved methods. As to grade, crown, width, drainage, foundations, surface, etc., see ROAD.

The longer movements of armies are made by rail or steamboat, and in the early stages of war, during the mobilization of the army and the forwarding of its equipment and supplies, the railroad occupies a position of prime importance. It plays an important part in all operations, whether offensive or defensive. The objective railroad points are usually the large railroad centres, junctions, etc., the great objective point being the frontier, for throughout continental Europe railroads are built as much for strategical reasons as for purely commercial purposes, so that their general direction is towards the frontiers, fortified places, magazines, general-supply stations, and important points of rendezvous. The military Powers of Europe in addition to their railroad troops include the personnel of railroads in their national military scheme of defense, so that on the call for mobilization the railroad employee at once becomes a component part of the military forces.

The *International Military Digests* summarized information concerning the German and French railway systems at the time of the Great War of 1914 as follows: "The railway system of Germany comprises 37,000 miles and is more extensive than the French system, though about equal in ratio of length to population. Double-track railroads are more numerous in Germany than in France, and some have four tracks. The chief difference, however, is the extensive development of cross-connecting railways, stations, and loading platforms in Germany.

"The most numerous and most important railways cross Germany from east to west. Fourteen lines cross the German frontier between Switzerland and Holland, with two parallel cross-connecting lines, one on each side of the Rhine.

"The whole system permits rapid concentration along the Rhine and easy shifting of forces to any desired point along the frontier. A number of smaller lines lead from the interior of Germany to the Rhine. The supply of rolling stock is ample. It is calculated that

an army of 100,000 men could be transported from one frontier to the other in two days."

The Japanese army in its advance on Mukden in the war with Russia (1904–1905) depended upon the railroad from Dalny. The Russians were dependent upon the long line of the then single-track Trans-Siberian Railroad for reënforcements, material, and largely for supplies. Since then the double tracking of the road has been vigorously prosecuted.

The United States statutes provide for preference in time of war for the transportation of troops and material of war. The movement of troops over commercial railways is the function of the Quartermaster Corps, who plan and prepare for the move in accordance with regulations and orders. When organizations are moved by rail with their animals, equipment, and material, complete units of command are kept together in trains, which are divided into convenient train sections. The time required for loading troops leaving station to go into the field should not exceed one hour for infantry, one and a half hours for cavalry and light artillery, and two hours for horse artillery and for engineers with bridge train. A service of military railways is organized when extensive operations of a field force are dependent on a line or lines of railway for its supply. The construction, operation, and maintenance of these railways and of all railways captured is a duty of the Corps of Engineers. The difficulties experienced in the construction of bridges to carry roads over streams, etc., are referred to under BRIDGES AND DOCKS, MILITARY. For the destruction of railways and bridges, see DEMOLITION.

ROADSTER. See MOTOR VEHICLE.

ROAN (rōn) **ANTELOPE.** One of the largest and finest antelopes of Central Africa (*Hippotragus*, or *Egoceros, equinus*), related to the oryx, and called bastard gemsbok by the Boers. It is more than 4½ feet high at the withers and varies from bright roan-color to various tints of gray or brown, with the face dark brown, broken by a broad white streak in front of each eye, and a white nose. The horns of the bucks are massive, heavily ringed, and sweep backward in a scimitar-like curve which may measure from 33 to 42 inches. This species, though widely distributed, was never very numerous nor inclined to gather into large herds. Consult authorities cited under ANTELOPE. See Plate of ANTELOPES.

ROANNE, rō'ăn'. The capital of an arrondissement in the Department of Loire, France, on the left bank of the Loire, which is here navigable, 42 miles northwest of Lyons by rail (Map: France, S., H 2). Its streets are wide and its houses handsome. The chief structures are the bridge over the Loire, the public library, and the college buildings. Roanne manufactures muslins, calicoes, and woolen and other fabrics. Shipbuilding is carried on. It has numerous Gallo-Roman remains. Pop., 1911, 36,397.

ROANOKE, rō'ă-nōk'. A city in Roanoke Co., Va., 56 miles west of Lynchburg, on the Roanoke River and on the Norfolk and Western and the Virginian railroads (Map: Virginia, E 4). It is picturesquely situated between the Blue Ridge and Alleghany Mountains and has the Virginia College (female), Rebekah Sanitarium, and six hospitals. In the immediate vicinity are Elizabeth College (female) and Roanoke College (both Lutheran), and Hollins College, a large women's college under Baptist control. Roanoke has extensive construction and repair shops of the Norfolk and Western Railroad. Industrially the city ranks sixth in the State. The most important manufactures are cars, locomotives, flouring and grist mill products, bridges, structural steel and iron, metal culverts, monuments, cans, twine, silos, overalls, candies, tents and awnings, hydraulic engines, agricultural implements, lumber, brick, cigars, etc. The government is vested in a mayor, chosen every four years, and a bicameral council. In 1880 Roanoke, then called the town of Big Lick, had a population of only 639. In 1884 Roanoke was chartered as a city. Pop., 1900. 21.495; 1910, 34,874; 1915 (U. S. est.), 41,929; 1920, 50,842.

ROANOKE COLLEGE. An institution for higher education, founded in 1853 at Salem, Va., as the successor to the Virginia Institute. It remained open during the Civil War, though without endowment, and has made rapid development in recent years. In addition to the collegiate department, with the partially elective courses, leading to the degree of B.A., partial and commercial courses are offered. A preparatory department formerly connected with the colleges has been segregated from it. There were 205 students in all departments in 1915, and the faculty numbered 19. The library contains about 25,000 volumes. The endowment of the college amounts to about $215,000 and the annual income to about $32,000. The grounds and buildings are valued at $144,000. The president in 1915 was J. A. Morehead, A.M., D.D.

ROANOKE ISLAND. An island about 10 miles long and of an average width of 2 miles, off the coast of North Carolina, forming part of Dare County and separated from the mainland by Croatan Sound (Map: North Carolina, G 2). It is noted as the site selected by Sir Walter Raleigh (q.v.) in his attempt at colonization in 1585–87. On Feb. 8, 1862, a Union force under General Burnside captured the Confederate garrison.

ROANOKE RIVER. A river formed in southern Virginia by the union of the Dan and the Staunton, which rise in the Blue Ridge (Map: Virginia, F 5). It flows in a winding southeast course of 185 miles through a fertile and picturesque valley in northeastern North Carolina and empties into Albemarle Sound. Its length, including the Staunton, is 450 miles, and it is navigable for steamers 120 miles to Weldon.

ROARING (*laryngismus paralyticus*). A disease of the horse due to a paralysis of the muscles of the larynx, usually caused by the pressure of an inflamed or hypertrophied bronchial gland, which, by pressing against the left recurrent laryngeal nerve, interferes with its proper functions. In the case of chronic roaring medical treatment is of no avail, but in the earlier stages of the disease a course of iodide of potassium is strongly advocated where the cause of the trouble is to be attributed to disease of the lymphatic glands. In recent years much success has followed surgical interference.

Consult L. A. Merillat, *The Principles of Veterinary Surgery* (Chicago, 1905–09), and L. Pearson and others, *Special Report on Diseases of the Horse*, United States Bureau of Animal Industry (rev. ed., Washington, 1911).

ROARING BUCK'IE. The name among British people, especially in Scotland, for the local species of *Fusus*, a large spiral (conch) shell which, when held to the ear, furnishes a muffled roaring sound which children are told is the sound of the sea in which the creature lived. Really it is the audible reverberation of the otherwise inaudible sound of the rushing of the blood in the internal ear.

ROASTING, IN METALLURGY. The process of heating ore or other metallurgical material or products in order to expel some substances or to change the form of others. Often both objects are attained at the same time. Roasting may be performed either with or without access of air. When air is admitted the object may be to expel something that may be separated by heat alone, as when calamine (zinc carbonate) is roasted to expel carbonic acid; or to expel some substance as an oxide by utilizing the oxygen of the air, as when sulphides are roasted to expel sulphur as sulphur dioxide. Or the process may be resorted to when it is desired to raise some substance to a higher state of oxidation. When roasting is performed without access of air the object is to expel some substance without the formation of oxides or to reduce some oxide to a lower form or to metallic form. For the latter purpose a reducing atmosphere may be provided, i.e., one in which the action is to abstract oxygen from the material roasted. Roasting differs from calcination in that the latter process is used to reduce the material to the form of powder by the aid of heat, as when limestone is burned to form quicklime, carbonic acid being expelled and the oxide of calcium remaining in powder form. When metal ores are roasted without access of air to such temperature that the metal is volatilized, as is done in the metallurgy of zinc and mercury, the process is usually called distillation. Roasting is commonly practiced to prepare an ore for further metallurgical treatment. See COPPER.

ROB'ALO (Sp. *róbalo*, Catalan *llobarro*, name for the European bass, probably from Lat. *labrus, labros*, from Gk. λάβραξ, *labrax*, sea wolf, from λάβρος, *labros*, furious, fierce, greedy). Any of several fishes of the tropical shores of America resembling sea bass, but set apart in the family Centropomidæ. All are robust, dark-colored fishes, from 2 to 4 feet in length, and several kinds are of great importance in the local markets. The most valuable in the West Indies and along the Spanish Main is the species *Centropomus undecimalis*, called also snook and brochet-de-mer.

ROBBER CRAB. See COCONUT CRAB.

ROBBER FLY. Any one of the dipterous insects of the family Asilidæ. These are strong, hairy, active, predatory flies, which are very numerous and always conspicuous, flying with a darting motion and preying upon many different kinds of insects. They are rather slender, but extremely strong, and are furnished with a large tapering hard beak inclosing a sharp lancet which is thrust out and cuts a severe wound in the body of the insect captured. The tip of the beak is bearded with stiff bristles, which hold it securely in the wound into which it is crowded. They destroy very many injurious insects, but are noted enemies of the honeybee.

ROBBER SYNOD. See EPHESUS, COUNCILS OF.

ROB'BERY (OF. *robberie, roberie*, from *robber, rober*, to rob, from ML. *raubare*, from OHG. *roubōn*, Ger. *rauben*, Goth. *bi-raubōn*, AS. *rēafian*, Eng. *reave;* connected with Lat. *rumpere*, to break, Skt. *lup*, to break, plunder). In substance robbery is an aggravated form of larceny, although at common law it is treated as an independent offense. It consists in the larcenous taking of personal property which is on the person of another or under the immediate protection of his person, accomplished by means of violence or intimidation. The offense is thus both a crime against property and against the person. The mere force required in the asportation of the property taken is not sufficient to make the crime robbery. There must be violence to the person or acts causing fear. Thus, pocket picking by stealth or even snatching money from the open hand when there is no resistance is simple larceny. Threats which do not amount to threats of personal violence are not sufficient to constitute the taking robbery. The violence need not be offered to the person giving up his property, but if offered to a person related to him by blood or marriage, and money or property be extorted for the purpose of protecting such relative from immediate personal violence, the offense is robbery. If the taking is accomplished without threat or violence, the use of violence as a means of retaining possession of the stolen property will not make the crime robbery. As in larceny there must be a felonious intent (*animus furandi*), and if a person takes property from another under a bona fide claim of ownership, the crime is not committed. At common law robbery was a felony punishable by death. It is still deemed a felony, and is now punishable in England and the United States by penal servitude. See LARCENY. Consult the authorities referred to under CRIMINAL LAW.

ROBBIA, rôb'byȧ, DELLA. A celebrated family of Florentine sculptors and ceramists of the Renaissance, that flourished for nearly 150 years. Its earliest and most widely known member was LUCA DELLA ROBBIA (1399–1482), sculptor and originator of the famous terra-cotta productions bearing his name. He was born in Florence, the son of Simone di Marco della Robbia, a shoemaker, and was early apprenticed to a goldsmith. This craft he soon relinquished to work in bronze and marble, and attained great eminence as a sculptor, producing in both materials a series of superior works, by which his artistic standard must primarily be estimated, although he owes his universal popularity chiefly to his process of enameling terra-cotta figures.

Of his life we know very little. He may, as Baldinucci states, have received his training in sculpture from Ghiberti, but while his plastic work bears witness to a diligent study of that master's creations, it also shows an open eye and equally receptive feeling for the radically different art of Donatello. His individuality lies in the admirable equipoise between the idealism of the one and the realism of the other, having in common with Ghiberti the exalted feeling of beauty, the tasteful arrangement and easy flow of drapery, and with Donatello the serious observation of nature and vivid characterization. This is manifest in the master's earliest work known to us, the world-famed "Singing Galleries" (1431–38), 10 panels in high relief, with groups of children

singing, dancing, and playing upon musical instruments, equally remarkable for their truth and naturalness and for their grace of movement and form—easily Luca's master creation—executed for one of the organ galleries in the Duomo and now in the Cathedral Museum. His other works in marble comprise two unfinished reliefs of the "Deliverance" and "Crucifixion of St. Peter" (1438), in the Museo Nazionale; the eight allegorical reliefs of "The Liberal Arts and their Representatives" (1437–39), on the north side of the Campanile; the "Tabernacle" (1441–43), at Peretola; and the tomb of Benozzo Federighi, Bishop of Fiesole (1455–56), in San Francesco di Paola, on the Via Bellosguardo, outside Florence. The most laborious task, however, on which Luca was engaged in the cathedral was the execution of the bronze door of the north sacristy (1446–69), with reliefs of the "Evangelists," the "Fathers of the Church," etc., each subject with attendant angels, the whole modeled with exquisite grace and unassuming dignity—one of the most perfect productions in bronze of the Quattrocento.

Meanwhile Luca had already entered upon the second phase of his activity and given to the world another new and beautiful art; for after many experiments he succeeded, by coating baked figures of clay with a stanniferous enamel, in producing works almost indestructible and very attractive in color. He was not the inventor of impervious glaze, which had been known and used in Italy for two centuries or more; but its application to sculpture in terra cotta and that of the latter to architecture were original with Luca. These productions were nearly always in the form of relief. Among his numerous representations of the Virgin and Child, of infinite variety, the finest are a lunette once over a shop in Via dell' Agnolo (see illustration), another from San Pierino, and the "Madonna del Fiore." They are preserved in the Museo Nazionale, Florence, which now possesses the largest number of his works, including several interesting coats of arms and the portrait head of a girl. In Florence are: an ambitious "Resurrection" (1443) and "Ascension" (1445), and two fine angels bearing candelabra, in the cathedral; four reliefs of "Evangelists," in the Pazzi Chapel, Santa Croce, and four circular reliefs of the "Virtues," his last work on record, in the Portogallo Chapel, San Miniato. At Pistoia is an early "Visitation" of great beauty, the first free-standing group in modern art; at Impruneta, near Florence, a relief of the "Crucifixion" and two tabernacles; and in Urbino over the portal of San Domenico a lunette of the Madonna with four saints. Outside of Florence Luca is best represented in the Berlin Museum, which possesses, among other works, the "Frescobaldi Madonna," the "Madonna with the Apple" and the medallion portrait head of a youth. In England a beautiful "Annunciation" and a Madonna were lately discovered by Professor Marquand in the church at Wellington, Somerset. In the United States Luca is represented by the Altman "Madonna" (Metropolitan Museum), and by others in the Bliss collection, New York, and the Shaw collection, Jamaica Plain, Mass., and by school pieces in the Boston Museum of Fine Arts and many private collections. Luca was an upright man of kindly and lovable character, whose modesty led him to decline public office when offered in 1471. From 1446 to his death on Feb. 20, 1482, he led a peaceful existence with his two orphaned nephews whom he had adopted as his sons.

He left a worthy successor to continue his work in his nephew and pupil ANDREA DELLA ROBBIA (1437–1528). Although inferior to Luca in power and in grandeur of conception, Andrea was at best an artist of exquisite taste and feeling. Unlike his uncle, he confined himself to works on terra cotta, with a single exception existing in the rich marble altarpiece in Santa Maria delle Grazie, outside Arezzo. Besides his many and varied figures of the Madonna which may be seen in the Museo Nazionale, he has left nothing more pleasing than those famous medallions with the "Bambini," on the façade of the Spedale degli Innocenti (Foundling Hospital) in Florence, each of the 14 babes in swaddling clothes a lifelike image of infant loveliness, with an individuality of its own. (See illustration to BAMBINO.) Here also is a graceful lunette with the "Annunciation." In the Ospedale di San Paolo, Florence, is a powerful relief, the "Meeting of Sts. Francis and Dominic"; in Santa Maria Maggiore, a fine Madonna; in the Monte di Pietà an effective "Man of Sorrows." At Verna in the Casentino are four fine altars, including the "Virgin Adoring the Christ Child"; in the cathedral of Arezzo three, with a Trinity; at Osservanza, near Siena, a "Coronation of the Virgin"; at Prato a "Madonna between Two Saints" (1489), over the principal entrance to the cathedral, and other works; and at Volterra a "Last Judgment" (1521). The Berlin Museum contains a "Madonna and Saints," a masterpiece in his early manner, and a small "Annunciation," unique in its rich coloring; and the Metropolitan Museum, New York, has a large retable of the "Assumption of the Virgin," with four saints, and a medallion portrait of a young man. A charming Madonna is in the Belmont collection, Newport, and there are good school pieces in the Boston Museum of Fine Arts, at Princeton University, and in many private collections.

Five sons of Andrea worked with him and, after his death, continued to produce the Robbia ware.—GIOVANNI (1469–c.1529) at first shows the purity and charm of his father's style, but later descends to the production of striking and gaudy effects. His purest work is the fountain in the sacristy of Santa Maria Novella, Florence; his best known and most ambitious the reliefs of the "Seven Works of Mercy," on the façade of the Ospedale del Ceppo, Prato. The most characteristic of his works in the United States is a large lunette of the Resurrection in the Brooklyn Institute Museum.—GIROLAMO (1488–1566) was active chiefly in France, where he aided in decorating the Château de Madrid for Francis I and was employed by his successors on important works. Research has not yet been able to distinguish satisfactorily the works of Andrea's other sons amid the vast output of the Della Robbia atelier, which flourished for 150 years. About 950 such atelier pieces survive. They are most numerous in the museums of Florence and Berlin, in South Kensington (London), and in the Louvre. In the United States there are also many examples in both public and private collections.

Bibliography. The chief authority on the Della Robbias is Prof. Allan Marquand, whose

LUCA DELLA ROBBIA
MADONNA AND CHILD
MUSEO NAZIONALE, FLORENCE

Della Robbias in America (Princeton, 1912) and *Luca della Robbia* (ib., 1914) are to be followed by others on Andrea, Giovanni, etc. Among others are those by Wilhelm Bode, *Die Künstlerfamilie della Robbia* (Leipzig, 1878), a pioneer in the subject; Marcel Reymond, *Les della Robbia* (Florence, 1897); L. Burlamacchi, "Luca della Robbia," in *Great Masters in Painting and Sculpture* (London, 1900); *Masters in Art*, vol. ii (Boston, 1901), containing an exhaustive bibliography; Maude Crutwell, *Luca and Andrea della Robbia and their Successors* (New York, 1902); Paul Schubring, "Luca della Robbia und seine Familie," in *Künstler-Monographien*, vol. lxxiv (Bielefeld, 1905). For reproductions, with a critical text, see Wilhelm Bode, *Denkmäler der Renaissanceskulptur toscanas* (Munich, 1905).

ROB'BINS, WILFORD LASH (1859–). An American Protestant Episcopal clergyman, born in Boston. He graduated at Amherst in 1881 and in 1887 at the Episcopal Theological School, Cambridge, serving while there also as rector at Lexington, Mass. Until 1903 he was dean of All Saints Cathedral Church, Albany, N. Y., and thereafter was dean of the General Theological Seminary, New York City. He wrote *Essay toward Faith* (1901) and *A Christian Apologetic* (1902).

ROBERT, *Fr. pron.* rô'bâr' (c.1054–1134). Duke of Normandy from 1087 to 1106. He was the eldest son of Duke William II (later William I of England), and early in life showed great skill in arms, but also habitual carelessness and indolence. His father refused to give him any share in the government, and Robert repeatedly rebelled against him. On the death of William, in 1087, he received Normandy as his inheritance. His rule was weak in the extreme and he involved himself in quarrels with his brothers William II of England and Henry (later Henry I). Finally in 1096 Robert assumed the cross and pledged his duchy to William for five years for 10,000 marks. In the crusade Robert proved to be at his best and he became one of the heroes of the expedition. After the capture of Jerusalem (1099) the royal crown is said to have been offered to him, but he refused and returned to Normandy, arriving there in 1100. William II was dead, and so Robert was released from his pledge, but he was soon engaged in war with Henry I. Finally Henry invaded Normandy, and at the battle of Tinchebrai, September, 1106, Robert was defeated and captured. He was kept in confinement for the rest of his life, dying at Cardiff, Feb. 10, 1134. Consult E. A. Freeman, *History of the Norman Conquest* (6 vols., Oxford, 1867–79), and id., *The Reign of William Rufus* (2 vols., ib., 1882).

ROBERT I, called ROBERT THE DEVIL (?–1035). Duke of Normandy from 1028 to 1035. He was a son of Duke Richard II, and succeeded his brother Richard III as Duke of Normandy. He combined cruelty and unscrupulousness with energy, audacity, and a handsome figure. He humiliated his vassals and conquered districts from his neighbors. He espoused the cause of Count Baldwin IV of Flanders against his son; of Henry I of France against his mother Constance; and of his nephews Alfred and Edward of England against Canute of Denmark. In 1033 he undertook a pilgrimage to Jerusalem as a penance for his sins. He died in 1035 while on his return, and was succeeded by his natural son William, later the conqueror of England. Many legends arose concerning him, like that embodied in the novel *La vie du terrible Robert le Diable, lequel fut après l'homme de Dieu*, which appeared at Paris in 1496. Consult E. A. Freeman, *History of the Norman Conquest*, vol. i (Oxford, 1873).

ROBERT II (c.970–1031). A king of France, son of Hugh Capet, whom he succeeded on the throne in 996. He was educated by Gerbert of Rheims, was a scholar and a poet, especially prominent as a composer, and gained the surname The Pious. He was not a strong king, and the country suffered from the papal interdict laid upon the King because of his second marriage with Bertha of Burgundy, who was related to him. He put her away in 1001 and later married Constance of Arles, a selfish and ambitious woman. His later years were troubled by the intrigues of his wife and sons. Consult Charles Pfister, *Etudes sur le règne de Robert le Pieux* (Paris, 1885), and Ernest Lavisse, *Histoire de France*, vol. ii, part ii (ib., 1901).

ROBERT I. King of Scotland, better known as Robert Bruce (q.v.).

ROBERT II (1316–90). King of Scotland from 1371 to 1390. His father was Walter, the Steward of Scotland, and his mother Marjory, daughter of Robert Bruce. During the reign of his uncle, David II, he was one of the most prominent of the patriotic nobles of Scotland, acting as Regent or joint Regent during three different periods, and he was present at the battles of Halidon Hill (1333) and Neville's Cross (1346). On the death of David he obtained the crown, and became the founder of the Stewart, or Stuart, dynasty, in virtue of the law of succession adopted by the council of estates held in 1318. Partly from disposition and partly from the infirmities of age, Robert proved a peaceable, inactive ruler. The wars waged with England after 1377 were conducted by the powerful barons, particularly the Earls of Douglas, Mar, and Moray. These contests, which consisted to a large extent of border raids, caused great suffering on both sides. The chief incidents of Robert's reign were the attack on Scotland by an English military and naval force under the command of the Duke of Lancaster (see JOHN OF GAUNT); the invasion of King Richard II himself in 1385, which wasted the land as far as Edinburgh and Fife; and the retaliatory expedition of the Scotch in 1388, when two armies invaded and devastated England. The smaller body on its return home won, though at the expense of the life of its gallant leader, James, Earl of Douglas, the brilliant victory of Otterburn. (See CHEVY CHASE.) In 1389 the estates practically deposed Robert by making his son guardian of the Kingdom. Robert died at his castle of Dundonald, in Ayrshire, May 13, 1390. Consult P. F. Tytler, *History of Scotland*, vol. iii (3d ed., Edinburgh, 1845), and Andrew Lang, *History of Scotland*, vol. i (ib., 1900).

ROBERT III (c.1340–1406). King of Scotland from 1390 to 1406. He was the illegitimate son of Robert II. He was originally called John, Earl of Carrick, but changed his name on his accession to the throne in order to continue the name held by his father and grandfather. His ineptitude as a ruler virtually placed the reins of government in the hands of his ambitious brother, Robert, Earl of Fife, whom, in 1398, he created Duke of Albany.

The latter in 1402 probably brought about the death of the King's eldest son, the Duke of Rothesay, because he was in danger of being ousted from control. The principal events in Robert's reign were the invasion of Scotland in 1400 by Henry IV of England and the retaliatory expedition of the Scotch, which resulted in the complete defeat of the invaders at Homildon Hill (q.v.). Robert died at Rothesay, April 4, 1406, from grief, as is said, because his remaining son, later James I (q.v.), was captured by the English while on his way to France. Sir Walter Scott, in *The Fair Maid of Perth*, has used some historical and traditional incidents of Robert's reign. Consult authorities cited under ROBERT II.

ROBERT, CHRISTOPHER RHINELANDER (1802–78). An American philanthropist, born at Brookhaven, Long Island. After five years as a shipping clerk in New York he removed to New Orleans, where he entered business for himself. In 1830 he returned to New York and founded the firm of Robert and Williams, of which he continued the senior member until his retirement from active business in 1862. At the time of the Crimean War he visited Constantinople and became interested in the subject of higher education in the Turkish Empire. In 1860 he invited the Rev. Cyrus Hamlin (q.v.) to visit the United States for the purpose of raising funds to endow a college on the Bosporus and he himself subscribed $10,000. The outbreak of the Civil War soon afterward, however, made it impossible to arouse general interest in the project, so Mr. Robert undertook to carry it through alone. Until his death in 1878 he provided the running expenses of the college, now known as Robert College (q.v.), and in his will left it one-fifth of his estate, his benefactions aggregating more than $400,000.

ROBERT, HENRY MARTYN (1837–). An American soldier, engineer, and parliamentarian, born at Robertville, S. C. He graduated at West Point in 1857, as engineer was employed on the defenses of Washington, Philadelphia, and New Bedford in 1861–65, and for two years had charge of the department of practical military engineering at West Point. He was chief engineer of the Military Division of the Pacific in 1867–71, thereafter until 1895 was in charge of various lighthouse districts and of river and harbor improvements, and from 1897 to 1901 was supervising engineer of 12 United States engineering districts from Pittsburgh to Galveston. He also served as president of the United States Board of Engineers for Fortifications from 1895 to 1901 and of the New York and Philadelphia harbor line boards, and in 1901–02 was a member of the commission to design a sea wall for Galveston. Promoted to brigadier general chief of engineers in 1901, he was retired the same year. Robert's name is best known for his *Pocket Manual of Rules of Order for Deliberative Assemblies* (1876), which is generally known as *Robert's Rules of Order for Deliberative Assemblies* (525th thousand, 1915).

ROBERT, rō'bĕrt, KARL (1850–). A German classical scholar, born at Marburg. After study at the universities of Bonn and Berlin and in Italy and Greece, he became professor at Berlin (1877) and at Halle (1890). His most important publications are: *Eratosthenis Catasterismorum Reliquiæ* (1878); *Bild und Lied* (1881); *Antike Sarkophag-Reliefs* (2 vols., 1890–1904); *Studien zur Ilias* (1901). He was also coeditor of *Hermes* and reviser of Preller's *Griechische Mythologie* (4th ed., vol. i, 1893); *Szenen aus Menanders Komödien*, a translation of the newly found fragments of Menander (q.v.) (1908); *Der Neue Menander* (1909); *Pausanias als Schriftsteller* (1909).

ROBERT, rō'bâr', LÉOPOLD (1794–1835). A Swiss-French genre painter, born at Les Esplatures, near La Chaux-de-Fonds, Switzerland. He studied engraving with Girardet and painting under David and Gros. He went to Italy in 1818 and began what proved to be a popular series of pictures from brigand life. Afterward he painted Italian peasants, such as "Peasant Woman of the Campagna" (1824), "Festival of the Madonna dell' Arco" (1827), and "Arrival of the Reapers in the Pontine Marshes," all in the Louvre. His works are large figure compositions, lacking spontaneity, hard in color, and with academic precision of line. Robert was the first to paint subjects from contemporary life when everything classic was the fashion. For this reason he has been claimed by the Romanticists, but he remained at heart a Classicist. He committed suicide in Venice in 1835. Consult Delécluze, *Notice sur la vie et les ouvrages de Léopold Robert* (Paris, 1838).

ROB'ERT COLLEGE. An institution founded in Constantinople by American philanthropy for the higher education of natives of the Turkish Empire. The aim of the founders was to establish "a model Christian college, in which the first object is the development of Christian manliness in the students through the cultivation of the spiritual as well as the intellectual life." The establishment of such an institution was suggested to Christopher Rhinelander Robert (q.v.) in 1857 by two graduates of Yale University, James and William Dwight, sons of an American missionary in Turkey, but nothing came of the plan until 1863. In this year Dr. Cyrus Hamlin (q.v.), coöperating with Robert, opened the college in a rented house in Bebek on the Bosporus. The trustees of Robert College of Constantinople were incorporated in the State of New York in 1864, and the college became a part of the university of the State of New York. In 1869 official recognition was given to the college in an irade from the Sultan. The institution was maintained at this time almost wholly by Robert, and at his death in 1878 it received one-fifth of his estate. In 1871 the present site of about 20 acres on the heights of Rumeli Hissar was acquired and a number of buildings and residences for professors have been built. The college maintains preparatory and collegiate departments. The former receives pupils at the age of 10; the latter offers a five-year course leading to the A.B. and S.B. degrees to pupils entering at the age of 14. More than 3000 students have been educated at Robert College since its establishment. At the date of the last report of the Education Department of the State of New York the college had an enrollment of 114 students in the collegiate department and a faculty of 61 members. The president in 1915 was Rev. Caleb Frank Gates, D.D., LL.D.

ROBERT D'ARBRISSEL, rō'bâr' där'brē'sĕl'. See FONTEVRAULT, ORDER OF.

ROBERT DE LUZARCHES, de lụ'zärsh' (?–1223). A French architect of the Gothic period. His name is derived from his birthplace in the Ile de France, of which school

of architecture he was a lay member. In 1220 he was intrusted by Evrard de Fouilly, Bishop of Amiens, with the reconstruction of the cathedral, which had been destroyed by fire two years previously. He furnished the general plan and directed the work, beginning, contrary to custom, with the nave. His plans were followed in the main by his successors, Thomas de Cormont and the latter's son Renaud, and we may therefore ascribe to him the general constructive features of the cathedral, which represent the highest and most perfect development of Gothic architecture in France. The school of architecture which he founded at Amiens became one of the most influential in France, and its influence radiated throughout Europe. In Germany, e.g., the cathedral of Cologne is modeled upon that of Amiens.

ROBERT-FLEURY, flĕ′rĕ′, JOSEPH NICHOLAS (1792–1890). A French historical painter. He was born at Cologne (then in France) and studied under Girodet, Gros, and Horace Vernet at Paris. He made deep studies of the period to be represented in his paintings, which are of more historical than artistic interest. The most important include "Charles V in the Monastery of Saint-Yuste" (1857), the "Religious Conference at Poissy" (1840, Louvre), and "Jane Shore" (1850). Robert-Fleury was a member of the Institute and director of the French Academy in Rome (1865).

His son, TONY ROBERT-FLEURY (1838–1912), an historical, genre, and portrait painter, was born in Paris and studied under Paul Delaroche and Léon Cogniet. In 1870 he won the Grand Medal of Honor for the "Last Day of Corinth," a huge historical composition with many nude figures, now in the Luxembourg, typical of his early manner. Later, under the influence of impressionism, he changed his style and subjects. His "Old Women of the Piazza Navona" (1867) and "Anxiety" are also in the Luxembourg, and the "Musical Cardinal" is in the Metropolitan Museum, New York.

ROBERT LE DIABLE, rŏ′bâr′ le dyâ′bl'. An opera by Meyerbeer (q.v.), first produced in Paris, Nov. 21, 1831; in the United States, Dec. 17, 1851 (New York).

ROB'ERT OF GLOUCESTER, glŏs′tĕr (fl. 1260–1300). An English (metrical) chronicler, of whom little is known except that he was alive about the time of the great battle of Evesham (1265). The verse chronicle bearing his name is a history of England. It exists in two recensions, which vary but little down to the end of the reign of Henry I (1135). From this date they differ greatly, the one continuation being much longer than the other. Robert of Gloucester is usually credited with the longer continuation and may have written the original portion. The shorter continuation is apparently from another hand. The older portion was derived mainly from Geoffrey of Monmouth, Henry of Huntingdon, and William of Malmesbury. Thus only the longer continuation has value as an historical document, and the valuable part is that which deals with the Barons' War under Henry III, and as a whole the chief interest in the chronicle is linguistic. It is in the dialect of Gloucestershire, with which district the author shows minute familiarity. The principal extant manuscripts are the Harleian, the Cottonian, the Cambridge, and the Bodleian. The chronicle was edited by Hearne (Oxford, 1724; reissued 1810), and by Aldis Wright for the *Rolls Series* (2 vols., London, 1887).

ROB'ERTS, BENJAMIN STONE (1811–75). An American soldier, born at Manchester, Vt. He graduated at West Point in 1835, but in 1839 resigned from the army. He then became a civil engineer, built the Champlain and Ogdensburg Railway, and in 1842 helped to construct Russian railways. Reëntering the army in 1846, he served with distinction in the Mexican War, especially at Chapultepec, Matamoros, and the Pass of Galaxara. During the Civil War he was for a time in New Mexico as commander of the Southern District, becoming brigadier general of volunteers in 1862. Afterward he was transferred to Virginia, where, as chief of cavalry and acting inspector general, he fought at Cedar Mountain, Rappahannock Station, and in the second battle of Bull Run. Next he commanded an expedition against the Chippewa Indians. In 1864 he was made chief of cavalry in the Department of the Gulf and in 1865 was put in command of the District of West Tennessee. He became brevet brigadier general in the regular army, major general of volunteers, and in 1866 lieutenant colonel of the Third Cavalry. From 1868 to 1870 Roberts was professor of military science at Yale. He was the inventor of the Roberts breech-loading rifle.

ROBERTS, BENJAMIN TITUS (1823–93). An American clergyman, one of the founders of the Free Methodist church. He was born at Leon, N. Y., and graduated at Wesleyan University in 1848. For 10 years he was a member of the Genesee conference (western New York) of the Methodist Episcopal church and prominent among a body of strictly Wesleyan reformers, whose criticism of modern conditions he voiced in the *Northern Independent* in 1857. This article was adjudged a slander, and Roberts was expelled from the church (1858). In 1860, with Joseph McCreery and others, he formed the Free Methodist church. (See METHODISM, *America.*) Roberts was general superintendent of the new denomination (1860–93) and president of its seminary in North Chili, N. Y. He founded and edited the *Earnest Christian* (1860–93) and edited the *Free Methodist* (1886–90).

ROBERTS, CHARLES GEORGE DOUGLAS (1860–). A Canadian poet, novelist, and writer of animal stories. He was born at Douglas, near Fredericton, New Brunswick, and was educated at the Fredericton Collegiate School and at the University of New Brunswick. For a short time he edited Goldwin Smith's newspaper, the *Week*, of Toronto (1883–84), and he was professor of English and French literature in King's College, Nova Scotia (1885–87), and then of English and economics (1887–95). He resigned to devote himself wholly to literature. In 1897–98 he was associate editor of the *Illustrated American* of New York. Roberts's reputation rests chiefly on his poetry, the imaginativeness, insight, and artistic finish of which have won wide and discriminating praise. Especially fine is his ode for the Shelley centenary. His novels show accurate observation and offer exquisite descriptions of nature in the Maritime Provinces, where for the most part the scenes are laid; but the characters are somewhat deficient in dramatic vigor. Roberts's animal stories and sketches are sympathetically conceived in the conviction that "we and the

beasts are kin." *Red Fox* is a masterpiece in its kind. His volumes of verse comprise: *Orion and Other Poems* (1880); *In Divers Tones* (1887); *Ave: An Ode for the Shelley Centenary* (1892); *Songs of the Common Day* (1893); *The Book of the Native* (1897); *New York Nocturnes* (1898); *Collected Poems* (1900); *The Book of the Rose* (1903). His novels, nature stories, and other works include: *The Canadians of Old* (1889), from the French; *Appleton's Canadian Guide* (1890); *The Raid from Beauséjour* (1894); *Reube Dare's Shad Boat* (1895); *Around the Camp Fire* (1896); *Earth's Enigmas* (1896); *A History of Canada* (1897); *The Forge in the Forest* (1897); *A Sister to Evangeline* (1898); *By the Marshes of Minas* (1900), a collection of short stories; *The Heart of the Ancient Wood* (1900); *The Kindred of the Wild* (1902); *Barbara Ladd* (1902); *The Watchers of the Trails* (1904); *Red Fox* (1905); *Kings in Exile* (1910); *Neighbors Unknown* (1911), animal stories; *Feet of the Furtive* (1912); *Children of the Wild* (1913); *Hoof and Claw* (1914). Consult: James Cappon, *Roberts and the Influence of his Time* (New York, 1900); William Archer, *Poets of the Younger Generation* (ib., 1902); J. B. Rittenhouse, *The Younger American Poets* (Boston, 1904).

ROBERTS, David (1796–1864). A Scottish landscape and architectural painter. He was born at Stockbridge, near Edinburgh, and was at first apprentice to a house painter, with whom he remained seven years. He then studied at the Trustees' Academy, Edinburgh, and was employed as a scene painter in Glasgow, Edinburgh, and London theatres. His first important paintings were the result of a journey to the Continent in 1824. Afterward he traveled extensively in Europe and in the East, devoting himself particularly to architecture and interiors. In 1841 he was made Royal Academician. Roberts produced works in both oils and water colors. Among the former are "Interior of the Cathedral, Burgos" and the "Church of St. Paul at Antwerp," National Gallery, London; "Sunset in Rome," Edinburgh National Gallery. The South Kensington Museum has several of his water colors, including the "Great Temple of Edfou, Egypt" (1838), "Pyramids from the Nile" (1845), and a "Gateway, Spain." As a result of his travels Roberts published several series of lithographed sketches (1839–59), the best known of which are *Sketches in Holy Land and Syria* (1842) and *Italy, Historical, Classical, and Picturesque* (1859).

ROBERTS, Edmund Quincy (1784–1836). An American diplomat, born at Portsmouth, N. H. At 16 he went to South America. After living in London for a time he returned to the United States, and in 1832 was sent by President Jackson as an envoy to Siam, Cochin-China, and other countries of the Far East for the purpose of arranging commercial treaties. He returned in 1834 after successfully treating with Siam and Muscat, and in 1835 he started upon a second embassy, with Japan as the ultimate goal, but he died at Macao. He narrated the history of his first expedition in *Embassy to the Eastern Courts* (1837). Consult W. S. W. Ruschenberger, *A Voyage around the World, Including an Embassy to Muscat and Siam* (Philadelphia, 1838), and J. W. Foster, *American Diplomacy in the Orient* (Cambridge, 1903).

ROBERTS, Ellis Henry (1827–1918). An American journalist and financier, born at Utica, N. Y., and educated at Yale (A.B., 1850). From 1851 to 1889 he was editor and for several years was part proprietor of the Utica *Morning Herald*, a Whig and subsequently a Republican paper. He was a member of the State Legislature in 1866 and of Congress (1871–75), was Assistant Treasurer of the United States (1889–93), president of the Franklin National Bank, New York (1893–97), and Treasurer of the United States (1897–1905). He published: *Government Revenue* (1884; 4th ed., 1888); *New York, the Planting and Growth of the Empire State* (2 vols., 1887; 3d ed., rev., 1904), in the "American Commonwealth Series."

ROBERTS, Evan John (1878–). A Welsh evangelist, born at Bwlchymynydd, Loughor, South Wales, the son of a collier. He was apprenticed to a blacksmith, but bought his freedom, and for a time attended a preparatory school at Newcastle Emlyn. While studying there he became subject to "voices" and "visions," and in 1904 he declared that he had several times personally communed with God. Soon afterward he left school and became the leader of the remarkable revival movement then developing in Wales. At first many considered him demented; to silence adverse criticism he submitted to examination by five English alienists, who pronounced him sane. At the end of the revival in 1906 he suffered a nervous collapse and thereafter until 1913 lived in retirement.

ROBERTS, George Evan (1857–). An American authority on finance, born in Delaware Co., Iowa. From 1878 to 1903 he was proprietor of the Fort Dodge *Messenger*, being also State printer in 1882–89. He was director of the United States Mint from 1898 to 1907 and in 1910–14, and between these periods of service was president of the Commercial National Bank of Chicago. In 1914 he became assistant to the president of the National City Bank, New York. His writings include: *Coin at School in Finance* (1895); *Iowa and the Silver Question* (1896); *Money, Wages, and Prices* (1897).

ROBERTS, Howard (1843–1900). An American sculptor. He was born in Philadelphia and studied there at the Pennsylvania Academy of Fine Arts and with J. A. Bailly and afterward in Paris under Dumont at the École des Beaux-Arts. Returning to America, he modeled a number of ideal busts, a good example being "Eleanor" in the Pennsylvania Academy. Other important works of this period are the statuette of "Hester Prynne" and "Hypatia," a life-sized statue, later carved in marble, which added much to his reputation. After a second visit to Paris he settled in Philadelphia in 1875. Notable also are: "The First Pose," awarded a medal at the Centennial Exposition; "Lot's Wife," a statuette of realistic and original conception; the statue of Robert Fulton, in the National Hall of Statuary, Washington. Roberts was one of the first of American sculptors to introduce modern French methods and technique into America.

ROBERTS, Isaac Phillips (1833–). An American agriculturist and educator. He was born in Seneca Co., N. Y. He became superintendent of the college farm at the Iowa State Agricultural College, secretary of the board of trustees (1869), and in 1870 was elected pro-

fessor of agriculture. From 1873 to 1894 he was professor of agriculture and dean of the faculty of agriculture in Cornell University, where from 1888 to his retirement in 1903 he was also director of the Agricultural Experiment Station. For many years Roberts served as assistant editor of the *Country Gentleman*. His writings include, besides some 1200 articles in agricultural publications: *The Fertility of the Land* (1898); *The Farmstead* (1900); *The Farmer's Business Hand-Book* (1903); *The Horse* (1905).

ROBERTS, Morley (1857–). An English author, born in London and educated at Owens College, Manchester. In 1874 he went out to Australia, where he worked as a laborer on the railroads and in the bush. Before 1887 he served as a sailor on several merchant ships. During his unconventional experiences on sea and land as well as on more purposeful travels in all parts of the world, Roberts gathered a wealth of material for stories of the wild and of the open sea. The long list of his books includes: *The Western Avernus* (1887); *King Bully* (1891); *Red Earth* (1894); *The Plunderers* (1900), giving an account of a sort of Jameson raid on the treasury of the Shah of Persia; *The Colossus* (1899), introducing Cecil Rhodes and other notabilities thinly disguised under fictitious names; *The Fugitives* (1901); *Immortal Youth* (1902); *The Way of a Man* (1902); *Lady Penelope* (1905); *The Idlers* (1905); *Midsummer Madness* (1909); *Sea Dogs* (1910); *Four Plays* (1911); *The Private Life of Henry Maitland* (1912), an account under the guise of fiction of the life of the English novelist George Gissing; *Gloomy Fanny* (1913); *Time and Thomas Waring* (1914).

ROBERTS, Oran Milo (1815–98). An American jurist and governor, born in Laurens District, S. C. He graduated at the University of Alabama in 1836, was admitted to the Alabama bar in 1837, was a member of the State Legislature in 1839–40, and in 1841 removed to the Republic of Texas. After the admission of Texas to the Union in 1846 he served until 1851 as a district judge. In 1857 he was elected an associate justice of the Texas Supreme Court. As colonel of the Eleventh Texas Volunteers he saw active service with the Confederate forces west of the Mississippi from 1862 until 1864, when he resigned his commission to become Chief Justice of the Texas Supreme Court. Displaced during the Reconstruction period, he was active in the new constitutional convention in 1866, and in the same year was elected United States Senator, but political disabilities prevented his taking his seat. In 1874 he again became Chief Justice of the State, and he remained on the bench until he was elected Governor in 1878. He was reëlected in 1880 and declined a third term in 1882. From 1883 until 1893 he was a professor of law in the State University. He was the author of *A Description of Texas* (1881); *Elements of Texas Pleading* (1891); *Our Federal Relations* (1892), a statement of the Southern side of the slavery controversy.

ROBERTS, Robert Richford (1778–1843). An American Methodist Episcopal bishop, born in Frederick Co., Md. He was largely self-educated. Joining the Baltimore conference in 1802, he was actively engaged in the ministry, with the exception of one year spent as presiding elder, until 1816, when he was elected Bishop. At the time of his death he was the senior Bishop of the church. Roberts was a member of the General Conferences of 1808, 1812, and 1816. Consult Charles Elliott, *The Life of Robert R. Roberts* (Cincinnati, 1844).

ROBERTS, Sir William (1830–99). An English physician, born at Bodedern, Anglesea, and educated at University College, London (M.D., 1854). After studying in Paris and Berlin he became house surgeon, and in 1855 full physician, to the Manchester Royal Infirmary—a post which he held until 1883. He was a fellow of the Royal Society, received the Cameron prize in 1879, and on his coming to London became a fellow of London University. In 1885 he was knighted. The use of predigested foods for the nutriment of invalids was introduced into England by him, and he was an authority on diet. Roberts wrote: "On Peculiar Appearances Exhibited by Blood Corpuscles under the Influence of Solutions of Magenta and Tannin" (1863), in which "Roberts's maculæ" were described; *A Practical Treatise on Urinary and Renal Diseases* (1865; 4th ed., 1885); *Lectures on Dietetics and Dyspepsia* (1885); *Collected Contributions on Digestion and Diet* (1891).

ROBERTS, William Charles (1832–1903). An American Presbyterian minister and educator, born near Aberystwyth, Wales. He graduated at Princeton University in 1855 and at Princeton Theological Seminary in 1858 and in that year became pastor of a church in Wilmington, Del. Afterward he had charge of churches in Columbus, Ohio, and Elizabeth, N. J. In 1882–86 and 1892–98 he was Presbyterian secretary of the Board of Home Missions, in 1886–92 president of Lake Forest University (Illinois), and after 1898 president of Centre College (Kentucky). He served as moderator of the General Assembly in 1889. Roberts is author of *The Great Preachers of Wales* (1865); *Translation of the Shorter Catechism into Welsh* (1867); *New Testament Conversions* (1895).

ROBERTS, William Henry (1844–1920). An American Presbyterian clergyman, born at Holyhead, Wales. He graduated at the University of the City of New York in 1863 and at Princeton Theological Seminary in 1873. Meanwhile he had been statistician in the United States Treasury Department and assistant librarian of Congress. In 1878–86 he was librarian at Princeton Theological Seminary and then until 1893 was professor of practical theology in Lane Theological Seminary. Actively identified with the movement to unite churches, he held office in various organizations having this purpose. Of the General Assembly of his denomination, of which he was stated clerk after 1884, he was moderator in 1907. His works include: *History of the Presbyterian Church* (1888); *The Presbyterian System* (1895); *Laws Relating to Religious Corporations* (1896).

ROBERTS, William Milnor (1810–81). An American civil engineer, born in Philadelphia, Pa. He began his service as an engineer in 1825, assisting in a minor capacity in the construction of the Union Canal of Pennsylvania. He was engaged on the improvement of the Lehigh Railroad Canal (1827–31), was senior assistant engineer in the construction of the Allegheny Portage Railroad (1831–35), and was chief engineer of the Lancaster and Harrisburg Railroad (1835–37), acting in 1836 and 1837 as chief engineer of the Cumberland Valley

Railroad as well. In 1838–40 he was chief engineer, in the State service, of the extension of the State canals of Pennsylvania and during 1841–44 was engaged successively on the enlargement of the Welland Canal of Canada and the Erie Canal of Pennsylvania. From 1857 to 1865 he lived in Brazil, constructing during this time the Dom Pedro Segundo Railroad. From 1869 to 1879 he was chief engineer of the Northern Pacific Railroad and during this period was a member also of various important engineering commissions. In 1878 he was elected president of the American Society of Civil Engineers. He died of yellow fever in the Province of Minas Geraes, Brazil.

ROBERTS-AUS'TEN, Sir William (1843–1902). An English metallurgist, educated at the Royal School of Mines. He was appointed chemist of the mint in 1870, in 1880 succeeded Percy as professor of metallurgy in the Royal School of Mines, and during the last year of his life was deputy master of the mint ad interim. His most important work was in the study of alloys, and his reports (1891, 1893, 1897, 1899) developed the system of the cooling curve, showed the significance of metallic freezing points, and in general greatly advanced the molecular theory of alloys. Roberts-Austen improved the pyrometer, making it photographically self-recording, and devised methods for several new alloys, among them that of gold and aluminium. He published *An Introduction to Metallurgy* (1891; 6th ed., rev., 1910) and over 70 papers in the *Proceedings of the Royal Society* and other learned societies and in scientific journals. See Metallography.

ROBERTS OF KANDAHAR, PRETORIA, AND WATERFORD, Sir Frederick Sleigh, first Earl (1832–1914). A British soldier, son of General Sir Abraham Roberts, born at Cawnpore in India, Sept. 30, 1832. He was educated at Eton, Sandhurst, and Addiscombe. At the close of 1851 he received a commission in the Bengal Artillery, and was sent to Peshawur, near the frontier of Afghanistan, where he served until 1857. During the Sepoy Mutiny he actively participated in the reduction of Delhi, in the second relief and the siege of Lucknow, and in the relief of Agra and of Cawnpore, and was awarded the Victoria Cross. In 1863 he participated in the Umbeyla campaign and in 1867 became assistant quartermaster-general of the Bengal brigade which took part in the Abyssinian War.

At the outbreak of the Afghan War in 1878, though only a major in his regiment, he was major general commanding in his division, that of Peshawur, and was selected to command one of the three columns organized to invade the enemy's country, being ordered to advance through the Kuram valley to the Shutargardan Pass. On December 2, at the Peiwar Kotal, the summit of the pass leading from the Kuram valley into Afghanistan, Roberts defeated a greatly superior force of the enemy. In October, 1879, he defeated a large force of Afghans near Kabul and took that city. In December, after a series of combats, he found it necessary to evacuate Kabul and collected his forces in a fortified position at Shirpur. Here he beat back the enemy and reëntered the Afghan capital before the close of the month. In 1880 he performed a memorable march from Kabul for the relief of Kandahar, which he entered on August 31. On the following day he dispersed the army of Ayub Khan, thus bringing the war to a close. After the British disaster at Majuba Hill Roberts was sent to South Africa as commander in chief. Before his arrival, however, peace had been concluded. He was commander in chief of the Madras army from 1881 until 1885, when he became commander in chief in India. In 1893 he was recalled to Europe and from 1895 until 1899 was in command of the forces in Ireland. In the latter year he was appointed commander in chief in South Africa. He marched successfully to the relief of Kimberley, and on February 27, at Paardeberg, a force of Boers under Cronje was compelled to surrender. On March 13 Roberts entered Bloemfontein, the capital of the Orange Free State, and on May 28 formally annexed the Free State to the British Empire. On June 5 he occupied Pretoria and on October 25 formally annexed the Transvaal. A few weeks later, thinking the war practically over, he returned to England, where he was decorated with the new Order of Merit, raised to the rank of Earl, and appointed commander in chief. He retired in 1904. His South African medal bore 24 clasps, an unprecedented number. In his last years Earl Roberts was indefatigable in his efforts to create a citizen army, "the pledge of peace." He founded and was president of the Society of Pilgrims. His death occurred Nov. 14, 1914, some weeks after the outbreak of the Great European War, while on a visit to France to encourage the Indian and other British troops at the front. He was given an elaborate military funeral and was buried in St. Paul's Cathedral. Lord Roberts published *The Rise of Wellington* (1895) and *Forty-One Years in India* (1897; new ed., 1915), an autobiography. Consult: J. M. Cobban, *The Life and Deeds of Earl Roberts* (4 vols., London, 1901); Sir George Forrest, *The Life of Lord Roberts* (New York, 1914); Roy Vickers, *Lord Roberts: The Story of his Life* (London, 1914); M. Menpes, *Lord Roberts* (New York, 1915).

ROB'ERTSON, Agnes. See Boucicault, Mrs. Dion.

ROBERTSON, Archibald Thomas (1863–). An American theologian, born near Chatham, Va. He was educated at Wake Forest (N. C.) College (M.A., 1885) and at the Southern Baptist Theological Seminary, Louisville, Ky. (Th.M., 1888), where he was thereafter instructor and professor of New Testament interpretation. Robertson is author of *Syllabus for New Testament Greek Syntax* (1900); *Bibliography of New Testament Greek* (1903); *Teaching of Jesus Concerning God the Father* (1904); *Short Grammar of the Greek New Testament* (1908; It. trans., 1910; Ger. trans., 1911; Fr. trans., 1911; Dutch trans., 1912); *Epochs in the Life of Paul* (1909; new ed., 1914); *John the Loyal, or Studies in the Ministry of the Baptist* (1911; new ed., 1915); *The Glory of the Ministry* (1911); *A Grammar of the Greek New Testament in the Light of Historical Research* (1914); *Practical and Social Aspects of Christianity* (1915); *Studies in the New Testament* (1915).

ROBERTSON, Donald (1860–). An American actor, born at Edinburgh, Scotland. He came to America in 1873, first appeared on the stage in 1879, and later played leading rôles in his own company in all important American cities. After 1908 his plays had their initial production at Fullerton Hall, in the Art Insti-

tute of Chicago; and in 1912 he organized his new company, the Drama Players, of which he became star and manager. His repertoire included Browning's *A Blot on the Scutcheon;* Goldini's *A Curious Mishap;* Ibsen's *John Gabriel Borkman, Hedda Gabler,* and *Ghosts;* Lamb's *The Intruding Widow;* Milton's *Comus;* Molière's *Tartuffe* and *The Miser;* Voltaire's *The Prodigal.* Robertson is author of *Rhymes* (1884); *Impressions in Rhyme* (1896); *Beauty's Lady* (1910); *Dramatic Poems, Songs, and Sonnets* (1915).

ROBERTSON, Frederick William (1816–53). An English preacher. He was born in London and was educated at Edinburgh. After a year of law study he studied theology at Brasenose College, Oxford, graduating in 1840. His first curacy was that of St. Maurice and St. Mary Kalendar, Winchester; but his health failed at the end of a year, and he was forced to seek rest on the Continent. His next curacy was at Christ Church, Cheltenham, where he remained four years and then again sought rest in the Tirol. In 1847 he went to St. Ebbe's, Oxford, and from there, in the same year, to Trinity Chapel, Brighton. It was as "Robertson of Brighton" that he became famous. A Broad Churchman, he laid emphasis not on theological discussions but on a vivid and compelling presentation of fundamental spiritual truths. He was noted also for his efforts on behalf of the workingmen of Brighton.

His *Sermons* were published in five series (1855–74); he published also *Literary Remains* (1876), *Lectures on Corinthians* (1859), and *Notes on Genesis* (1877). Consult the *Life and Letters of F. W. Robertson,* edited by Stopford Brooke (new ed., 2 vols., London, 1873); F. Arnold, *Robertson of Brighton* (ib., 1886); L. O. Brastow, in *Representative Modern Preachers* (new ed., New York, 1910).

ROBERTSON, George Croom (1842–92). A Scottish philosopher, born at Aberdeen. He studied at Marischal College, where he took his A.M. in 1861 and where he formed a lasting and helpful friendship with Prof. Alexander Bain (q.v.). He continued his philosophical studies at University College, London, and in France and Germany. After holding a minor appointment in Greek at Aberdeen, he was elected (1866) professor of mental philosophy and logic in University College. This position he held till just before his death. In spite of ill health Robertson exerted a great influence on his time. He was the first editor of *Mind,* his contributions to which were edited with a memoir by Professor Bain under the title *Philosophical Remains* (1894). Two volumes of his lectures at University College from 1870 to 1892 were edited by Mrs. Rhys Davids as *Elements of General Philosophy* and *Elements of Psychology* (1896).

ROBERTSON, James (c.1710–88). An English soldier, Governor of New York during a part of the Revolutionary War. He was born in Fifeshire and while a young man entered the army as a private. He served in America in the French and Indian War, first as major in the Royal American Troops, then as deputy quartermaster, and finally as lieutenant colonel in the campaign against Ticonderoga. After the war he became barrack master in New York City and is said to have acquired a fortune by clipping the coin used in buying supplies and by other unscrupulous methods. He was promoted colonel in 1772, was with the British army during the siege of Boston, and commanded a brigade at the battle of Long Island. He was made a major general in 1779 and in the same year was appointed civil Governor of New York. His administration was arbitrary and corrupt, and by his actions he alienated many who were still favorable to the royal cause. In 1781 he was appointed commander in chief in Virginia, but, owing to the arrival of Cornwallis in that province, he returned to New York. He went to England in 1783 and died in London. Consult F. W. Jones, *History of New York during the Revolutionary War,* edited by Oliver De Lancey (New York, 1879).

ROBERTSON, James (1742–1814). An American pioneer, born in Brunswick Co., Va., whence his parents early removed to North Carolina. In 1770 he crossed the Alleghanies with Daniel Boone and lived for a time on the Watauga River. He returned to North Carolina and in 1771 led a party of settlers to the Watauga region and was one of the founders of the Watauga Association (q.v.). When this region was found to be a part of the Cherokee lands of North Carolina, Robertson went as commissioner to the Indians. With John Sevier (q.v.) and 40 men he withstood a fierce attack on the fort by the Indians under Oconostota. In 1778 he joined Richard Henderson (q.v.) in the settlement of a large tract of land on the Cumberland and founded Nashborough (the present city of Nashville). On the formation of the Compact in 1780 he was elected chairman of the Board of General Arbitrators or Notables and colonel of the forces. Robertson was almost constantly engaged in Indian battles, led the Cold Water Expedition in 1785, and invaded the Indian country. On the organization of Tennessee as a Territory in 1791, he became brigadier general of the western or Miro district. He was a member of the convention to form a State constitution in 1786 and afterward acted as Indian agent. He was a State Senator in 1798 and a trustee of the Davidson Academy (Cumberland College) in 1803. In 1805, as special agent to the Chickasaws, he secured by the compact of July 23 the cession of much of their land and the same year secured the Choctaw lands in Mississippi. He was afterward called upon to arbitrate differences arising from confusion of boundaries. During the War of 1812 he did much to prevent the Indians from joining the British. Consult A. W. Putnam, *Life and Times of Gen. James Robertson* (Nashville, 1859), and Theodore Roosevelt, *Winning of the West* (new ed., 4 vols., New York, 1904).

ROBERTSON, James (1839–1902). A Canadian educator and missionary. He was born at Doll Appin, Scotland, went to Canada in his youth, was educated at Toronto University and in theology at Union and Princeton seminaries. He filled various Presbyterian pastorates in Ontario in 1869–74 and in the latter year became pastor of Knox Church, Winnipeg. In the then newly formed Province of Manitoba Robertson was the chief organizer and missionary of his church. He was lecturer on theology and philosophy in Manitoba College in 1875–81 and from 1881 until his death was superintendent of Presbyterian missions in the Northwest Territories and British Columbia. In 1895 he was elected moderator of the General Assembly of the Presbyterian Church in Canada.

ROBERTSON, James (1840–). A Scottish Orientalist, born in Alyth, Perthshire. He was educated at Aberdeen University and, in theology, at St. Mary's College, St. Andrews. In 1862–64 he was pastor of the Missionary Church of Scotland in Constantinople and then for 11 years was stationed at Beirut. In 1875–77 he held the pastorate of the Mayfield Church in Edinburgh and then for 30 years occupied the chair of Hebrew and Semitic languages in Glasgow University. Robertson published an English translation of Müller's *Outlines of Hebrew Syntax* (1882); *The Early Religion of Israel* (3d ed., 1892), Baird Lectures for 1889; *The Old Testament and its Contents* (1893; rev. ed., 1896); *The Poetry and Religion of the Psalms* (1898); *The First and Second Books of Kings* (1902), in the Temple Bible.

ROBERTSON, James Logie (pen name, Hugh Haliburton) (1846–). A Scottish poet and prose writer, born at Milnathort, Kinross-shire. In 1872 he graduated M.A. at Edinburgh, with honors in English literature. He was first English master in the Edinburgh Ladies' College from 1891 till his retirement in 1914. Travels in Scandinavia furnished him descriptive themes for some of his verse, but his best poems are short pastorals in Scottish dialect. His published volumes are mainly: *Poems* (1878); *Orellana and Other Poems* (1881); *Our Holiday among the Hills* (1882), conjointly with his wife; *Horace in Homespun* (1886; new ed., 1900); *Ochil Idylls* (1891); *Adaptations from Dunbar* (1895); *The White Angel, and Other Stories* (1886); *For Puir Auld Scotland* (1887); *In Scottish Fields* (1890); *Furth in Field* (1894); *History of English Literature* (1894); *Nature in Books* (1914). His editorial work includes the poems of Allan Ramsay (1887), Thomson (1891), Scott (1894), Burns (1896), Chaucer (1902), and Campbell (1907).

ROBERTSON, James Wilson (1857–). A Canadian educator. He was born in Ayrshire, Scotland, went to Canada with his parents in 1875, joined his father in farming and the management of cheese factories, and in 1886–90 was professor of dairying in the Ontario Agricultural College, Guelph. He was non-resident lecturer on dairy husbandry at Cornell University (1888–90), Dominion Dairy Commissioner (1890–95), Dominion Commissioner of Agriculture and Dairying (1895–1904), and principal of the Macdonald College of Agriculture at Ste. Anne de Bellevue, Province of Quebec (1905–10). In 1909 he became president of the Dominion Educational Association and in 1910 chairman of the Royal Commission on Industrial Training and Technical Education. In 1905 he was made a C.M.G. He published many lectures and *Conservation of Life in Rural Districts* (1911).

ROBERTSON, John G. (1867–). A British Germanist and educator. He was born in Glasgow and was educated in the universities of Glasgow and Leipzig. From 1896 to 1903 he was lector in English at the University of Strassburg and afterward held the chair of the German language and literature in the University of London. In 1905 he founded the *Modern Language Review.* Among his publications are: *Hartmann's Armer Heinrich* (1895); *Selections from the Correspondence between Schiller and Goethe* (1898); *History of German Literature* (1902); *Schiller after a Century* (1905); *Milton's Fame on the Continent* (1909); *Outlines of German Literature* (1911); *Goethe and the Twentieth Century* (1912); an edition of Lessing's *Nathan der Weise* (1912); *The Literature of Germany* (1913).

ROBERTSON, John Ross (1841–). A Canadian journalist. He was born in Toronto and was educated at Upper Canada College. After serving as reporter on various newspapers he was city editor of the Toronto *Daily Globe* (1864–66), was one of the founders of the *Daily Telegraph* (1866), went to London, England, where he represented the Toronto *Daily Globe* (1872–75), and in 1876 established the *Evening Telegram,* one of the most successful of Canadian newspapers. He promoted and contributed to charitable enterprises, notably the Hospital for Sick Children and the Lakeside Home for Little Children. Robertson ranked high as a Freemason, both in Canada and England, and in 1896 was elected to the Dominion House of Commons as a supporter of the Equal Rights party. (See Political Parties, *Canada.*) He published histories of the Freemasons and of the Knights Templars in Canada; also *Robertson's Landmarks of Toronto* (5 vols., 1905), and edited *The Diary of Mrs. John Graves Simcoe* (1911).

ROBERTSON, Sir Johnston Forbes-. See Forbes-Robertson, Sir Johnston.

ROBERTSON, Joseph (1810–66). A Scottish antiquary and historian. He was born at Aberdeen, where he studied at Marischal College. He led in the formation of the Spalding Club for printing the historical and literary remains of the northern counties of Scotland (1839); edited in turn the Aberdeen *Constitutional,* the Glasgow *Constitutional,* and the Edinburgh *Courant;* and was appointed historical curator in the Edinburgh Register House (1853). Robertson published, among other volumes, *Inventories of Jewels, Dresses, Furniture, Books, and Paintings belonging to Queen Mary* (Bannatyne Club, Edinburgh, 1863), but his chief work was *Concilia Scotiæ: Ecclesiæ Scoticanæ Statuta, 1225–1559* (id., 1866).

ROBERTSON, Morgan (1861–1915). An American author. He was born at Oswego, N. Y., and studied at Cooper Union, New York City. From 1877 to 1886 he was at sea, rising from cabin boy to mate and pilot, and then became a watchmaker and diamond setter in New York. He invented an improved periscope for submarines. Hard times and failing eyesight turned him to writing short sea stories for periodicals in 1894. His best-known volumes include: *A Tale of a Halo* (1894); *Spun Yarn* (1898); *Futility* (1898); *Where Angels Fear to Tread* (1899); *Masters of Men* (1901; new ed., 1914); *Shipmates* (1901); *Sinful Peck* (1903); *Down to the Sea* (1905); *Land Ho* (1905; new ed., 1908). *Chivalry,* a play, appeared in 1913. Consult the collection of appreciations entitled *Morgan Robertson the Man* (New York, 1915).

ROBERTSON, Thomas William (1829–71). An English dramatist. He was born at Newark-on-Trent, of a family connected with the theatre for several generations. Mrs. Kendal (q.v.) was his youngest sister. During his childhood and youth he was an actor in the provincial company of which his father was manager. He went to London in 1848 and became a writer for the magazines; for a time, too, he continued upon the stage, and in 1856 he married an ac-

tress, Miss Burton. His first play, *A Night's Adventure*, was produced by Farren at the Olympic Theatre in 1851. His first important success, however, was *David Garrick*, which was brought out in 1864 and with Sothern's acting had afterward a long run. His *Society* was produced by the Bancrofts at the Prince of Wales's Theatre in 1865. His reputation chiefly rests upon the series of comedies which succeeded it, including *Ours* (1866), *Caste* (1867), *Play* (1868), *School* (1869), and *M. P.* (1870). He was also the author of a novel called *David Garrick* and of other fiction. His death occurred in London on Feb. 3, 1871. Consult: *The Principal Dramatic Works of Thomas William Robertson, with Memoir by his Son* (London, 1889); T. E. Pemberton, *Life and Writings of T. W. Robertson* (ib., 1893); Clement Scott, *The Drama of Yesterday and To-Day* (ib., 1899).

ROBERTSON, WILLIAM (1721–93). A Scottish historian, born Sept. 19, 1721, in the Parish of Borthwick, Midlothian. Robertson was educated at the University of Edinburgh, and in 1741 he was licensed to preach, but he gave most of his time to historical studies. In 1759 he published his celebrated *History of Scotland*, which was an immediate success, notable at the time for its fairness as well as for literary excellence. In 1762 Robertson was made principal of the University of Edinburgh, and in 1763 he was elected moderator of the General Assembly, in which position he displayed great abilities as an administrator. In 1769 he published a *History of the Reign of Charles V*, which came to be considered his best work. In 1777 appeared a *History of America* and in 1784 a work on the knowledge the ancients had of India. Personally Robertson was a genial man possessing great conversational powers and having a large circle of friends. His writings have their good qualities, but lack naturalness and vigor, and all of his histories have been superseded. The best edition of Robertson's works was in eight volumes (Oxford, 1825). Consult: Dugald Stewart, *An Account of the Life and Writings of William Robertson* (Edinburgh, 1801–02); George Gleig, *An Account of the Life and Writings of William Robertson* (ib., 1812); Lord Brougham, *Men of Letters of the Time of George III* (London, 1846).

ROBERTSON, WILLIAM H. (1823–98). An American politician, born at Bedford, Westchester Co., N. Y. He received an academic education, studied law, and began practice in his native town. His political career began in 1849 with his election as a Whig to the State Assembly. In 1854 he was elected to the State Senate and in the same year was elected county judge of Westchester County and remained on the bench until 1866. He allied himself with the Republican party at its organization, was a presidential elector in 1860, and in 1866 was elected a member of the Fortieth Congress. From 1872 to 1881 he was again a member of the State Senate. In 1881 he was appointed collector of the port of New York by President Garfield, whose nomination he had helped secure by leading a part of the New York delegation at the national convention in 1880 to desert the Grant column. Robertson's nomination to the collectorship, made without consulting the wishes of the two Republican Senators, Roscoe Conkling and Thomas C. Platt (qq.v.), and, according to their claims, in violation of the President's pledge, was confirmed by the Senate, but it led to the resignation of the two Senators and resulted in a serious party split. In the bitter struggle between the Stalwart and Half-Breed factions which followed, Robertson was active in the campaign that resulted in the election of new Senators in the place of Conkling and Platt. Robertson held the collectorship until 1885, when he resumed his law practice. In 1888 he was again elected to the State Senate. Consult *Autobiography of Thomas Collier Platt* (ed. by L. J. Lang, New York, 1910).

ROBERTSON, SIR WILLIAM ROBERT (1860–). A British soldier, born at Welbourne, Lincolnshire. He became a lieutenant of dragoons in 1888, served in the Miranzai and Black Mountain expeditions in 1891 and was an intelligence officer in India in 1892–96. He was connected with the Intelligence Department of the War Office in 1899, and served on the headquarters staff in South Africa in 1900. He was then stationed at the War Office until 1907, at Aldershot was assistant quartermaster general and brigadier general of the general staff, and in 1910–13 was commandant of the Staff College, Camberley. During the European War he served as chief of staff of the army in France until December, 1915, when he was called back to England to succeed Sir A. J. Murray as chief of the general staff. Robertson received the K. C. V. O. in 1913.

ROBERTY DE LA CERDA, rō'bĕr-tē' dā lä thĕr'dä, EUGÈNE DE (1844–). A Russian sociologist and positivist, born in Podolia, the son of a Russian army officer descended from a Spanish grandee. He was educated at the universities of Heidelberg and Jena, traveled in Europe and America, and became a contributor to French reviews, particularly to Littré's *Philosophie Positive* and Ribot's *Revue Philosophique*. When his writings were suppressed in Russia in 1885, he settled in France and subsequently became a professor in the new University of Brussels. He wrote: *Sociologie* (French and Russian, 1876, 1880); *L'Inconnaissable* (1889); *Agnosticisme* (1891); *Comte et Spencer* (1895); *L'Ethique* (1897 et seq.); *Nietzsche* (1902); *La sociologie de l'action* (1907); *Les concepts de la raison et les lois de l'univers* (1912).

ROBERVAL, rō'bâr'vàl', GILES PERSONNE DE (1602–75). A French mathematician, born at Roberval, whence the name by which he is commonly called. After four years' study in Paris he was appointed professor of philosophy at the Collège Gervais (1631) and in 1633 succeeded Morin in the chair of mathematics at the Collège Royal de France, a position which he retained till his death. He was an eager fighter and quarreled bitterly with Cavalieri, insisting on the priority of his own discovery of the methods of the indivisibles, although he published nothing. He attacked Descartes because the latter's method of constructing tangents appeared about the same time as his own, and with Torricelli he carried on an angry polemic as to which first discovered the method for determining the area of a cycloid. He is best known from the Robervallian lines, which he discovered, curves of infinite length inclosing a finite space. He also occupied himself with mechanics and physics and is the inventor of a balance bearing his name. He was a member of the Academy of Sciences from its foundation

in 1666. Gallois collected his writings and published them in the *Recueil* of the French Academy of Science (1693).

ROBERVAL, Jean François de la Roque, Sieur de (c.1500–?). A French colonist in Canada, born in Picardy, France. After the return of Jacques Cartier (q.v.) from his first voyage, in 1536, Roberval was commissioned by Francis I to lead an expedition to Canada for the purpose of making new discoveries and probably of establishing a settlement, he being appointed lieutenant general and Cartier captain general. Roberval sailed in April, 1542—Cartier having preceded him by almost a year—arrived at Newfoundland on June 7, and wintered at Cape Rouge, his followers suffering terribly from starvation and cold. After June, 1543, when he seems to have started for the Province of Saguenay, all authentic record of him is lost. According to Thevet, his friend, he returned to France and was killed in Paris; according to other accounts he died at sea.

ROBESON, rŏb′ĕ-son, Lila (1880–). An American dramatic contralto, born in Cleveland, Ohio. She received her education at Western Reserve University and studied singing with C. S. Burnham and Mrs. S. C. Ford, of Cleveland, and Isadore Luckstone and Oscar Saenger, of New York. Her operatic début, as Ortrud, took place in Boston in 1911. In the following year she became a member of the Metropolitan Opera Company of New York, where she sang the principal contralto rôles. With a voice of great power and sympathetic quality she combined a splendid stage presence.

ROBESPIERRE, rŏb′spĕ-âr′, Augustin Bon Joseph (1764–94). The younger brother of Maximilien Robespierre, born at Arras. He was educated at the Lycée Louis-le-Grand at Paris, and then began the practice of law at Arras. He embraced the ideas of the French Revolution, and after holding a local office he was elected a member of the National Convention. In general he followed the policy of his brother. As a deputy on mission he was present at the siege and capture of Toulon, where he recognized the genius of Bonaparte, whom he made one of his intimates. On his return to Paris he tried to influence his brother to milder measures, but finally acquiesced in the sterner policy and voluntarily shared his brother's fortunes on the 9th Thermidor. He was guillotined July 28, 1794.

ROBESPIERRE, Maximilien Marie Isidore (1758–94). A leader of the French Revolution. He was born at Arras, May 6, 1758, the eldest of four children. After some time spent in the college at Arras, Maximilien was given a scholarship by the Bishop of Arras which enabled him to complete his education in the Lycée Louis-le-Grand at Paris. His brilliant career as a student gave him a reputation which proved of no little value upon his return to Arras in 1781 to begin the practice of his profession. His patron, the Bishop, appointed him criminal judge of the diocese of Arras in March, 1782, but he soon resigned the place rather than pronounce a death sentence. His literary tastes secured him an election to the Academy of Arras in 1783, and led him to compete, though with slight success, for prizes offered by the provincial academies. The summons of the States-General aroused him as it did hundreds of his fellows to political activity. Taking the popular side, he wrote pamphlets, engaged in discussions, and above all took care to look after his own fortunes. He was elected fifth deputy of the Third Estate of the Province of Artois.

Entering the States-General at the age of 31, he was almost unknown. Always adopting the popular and radical view, he spoke frequently, with such care in preparation and with such earnestness of manner that he soon overcame the defects of a shrill voice, small stature, pale nervous face, and twitching eyes partly concealed by greenish glasses. His former school friend, Camille Desmoulins, took pleasure in acting as the self-appointed press agent of the brilliant young radical, and the pages of the *Révolutions de France et de Brabant* made the name of Robespierre familiar throughout France. Mirabeau also noted him, but until the death of Mirabeau he, like others, was overshadowed by the greatest of the Revolutionists. It was not until May, 1791, that Robespierre began to exercise a real influence. In that month he pronounced his discourse favoring the abolition of the death penalty, and carried his unwise motion excluding from the future Legislative Assembly all members of the Constituent Assembly. During the summer of 1791 he opposed Barnave, Duport, and Lameth in the conservative revision of the constitution of 1791. During these two years, however, Robespierre's most important activity was not in the Assembly, but in the Jacobin Club. (See Jacobins.) He set about making himself the acknowledged head of the club and the leader of the people of Paris. His triumph was made complete when the conservatives were forced to withdraw from the club and organize themselves as the Feuillants (q.v.). His success in winning the Parisian populace to his support was demonstrated on Sept. 30, 1791, at the adjournment of the Constituent Assembly, when he and Pétion were crowned by the people as the true and incorruptible patriots. For a few months he held the office of public prosecutor, which he resigned because of the Girondist attacks. In his defense he started a journal called *Le Défenseur de la Constitution,* continued as *Lettres à mes Commettants* after the opening of the Convention. Still the leading exponent of the radical views, he used his position in the Jacobin Club to antagonize the Girondists, especially in their war policy. Marat was opposing the war as contrary to the interest of the state; Robespierre's grounds were rather humanitarian. Though a demagogue who was daily swaying the people of Paris by his eloquence in the Jacobin Club, he was not a man of action, and remained quiescent while the bolder spirits like Danton and Santerre directed the movement of June 20 and of Aug. 10, 1792, and it was only after the success of the latter day that he appeared at the city hall to take his place as a member of the insurrectionary Commune. No direct guilt attaches to Robespierre for the great crime of the Parisian mob, the prison massacres of September; still he was at that moment the popular hero and leader, and was a few days later elected as the first deputy from Paris in the new National Convention.

In the Convention Robespierre was the recognized leader of the radical popular party, now known as the Montagnards, and from the first was denounced by the Girondists as a bloodthirsty demagogue. Of great importance was his famous speech on the King's trial, in which

he carefully and clearly stated the logical position of the Convention and proclaimed: "Louis ought to perish rather than a hundred thousand virtuous citizens; Louis must die, that the country may live." By this speech and by his attitude throughout the trial Robespierre completely outgeneraled the Girondists, whom he forced to take what for them was an illogical position and vote for the execution of the King. His generalship, which took advantage of the mistakes and personal dislikes of the Girondists, also won to his side Danton, Billaud-Varenne, and the other strong men of action. Taking advantage of these circumstances, Robespierre in one of his characteristic speeches arraigned the Girondists on April 10, 1793. It was a struggle to the death, but its outcome was certain from the moment that Danton and his followers joined Robespierre. The coup d'état of May 31 and June 2 was the work of the men of action, but the victory was that of Robespierre.

Robespierre was not a member of the first Committee of Public Safety and was not one of the original members of the second or Great Committee of Public Safety, but was chosen to replace Gasparin, who resigned July 27, 1793. With the other members he was continued on the committee until his arrest exactly one year later on the fateful 9th Thermidor. The name of Robespierre has ever been almost synonymous with the committee, and both Robespierre and the other members gave currency to the notion that he ran the committee; but as a matter of fact the other members were the workers and never allowed Robespierre to interfere with them, and finally overthrew him because he attempted to make his reputed control of the committee a reality. Virtually the Great Committee of Public Safety (see FRENCH REVOLUTION) was a semiofficial ministry, of which Robespierre was Prime Minister without portfolio. He was the most valuable man on the committee, for, though he did none of the routine work and rarely appeared at its sessions, he was the one member who was known outside of the Convention and who had a national reputation; he was the ideal patriot, the "virtuous," the "incorruptible," and under his ægis the steady, clear-headed, industrious men of action toiled quietly, relentlessly, successfully to save France from the foes and perils that beset her. The notion of Robespierre as a bloodthirsty demon who daily breathed forth threatenings and slaughter is a total misconception; the truth is that the committee was convinced that the only way to accomplish its task of saving France was by a government of terror which should silence or destroy every foe of the nation. To the working members of the committee like Carnot and Billaud-Varenne the Terror was simply a business affair; to Robespierre it was a necessary preparation for the reign of virtue foreshadowed in the gospel according to Jean Jacques Rousseau, whose prophet he was. Robespierre was neither the dictator of the committee nor yet its dupe. He consciously assumed his share of the responsibility for its acts, he defended its policies in set speeches in the Convention and before the Jacobin Club, and he personally carried through the Convention one of the acts which contributed most to make the Terror an orgy of blood—the decree of Oct. 29, 1793, by which after a trial of three days it was made possible for the jury of the Revolutionary Tribunal to declare that they were convinced of the guilt of the accused even though they had not heard the defense.

In personal life and principle a Puritan, in religion a deist, in all things a true believer in Rousseau, this he preached, for this he labored, and in preparation for this he would destroy the vicious. With the aid of Camille Desmoulins and Danton, who also detested the extravagances of the Hébertists, he was able to send Hébert and 18 others to the guillotine after a trial that was a parody of justice. Danton, Camille Desmoulins, and the Dantonists were the next victims, because they laughed at the notions of Rousseau, because they saw that the Terror had done its work and that the time had come to exercise clemency, and because Danton was a possible rival to be feared both by Robespierre and by the committee. On April 5, 1794, Danton perished, a victim of his own greatness and of the injustice and fanaticism of his enemies, the men who were most indebted to him. After the death of Danton and his friends the work of destroying the victims went on more rapidly, and after Couthon had carried the outrageous decree of June 10 accelerating the procedure of the Revolutionary Tribunal, 200 victims a week were sacrificed to the guillotine. In the meantime Robespierre was busy inaugurating his reign of virtue by instituting the Worship of the Supreme Being. On May 7 he delivered his famous speech in the Convention on the relation of religion and morality to republican principles, after which the Convention decreed a festival of the Supreme Being, which took place on June 8 with Robespierre, then President of the Convention, acting as the pontiff of the new religion.

One more hecatomb of victims would clear away the remaining leaders who stood in the way of the reign of virtue. At these, some of whom were his associates in the committee or in the Convention, Robespierre planned to strike. After a prolonged absence from the Convention and the committee, Robespierre appeared in the Convention on July 26, 1794, and delivered one of his carefully prepared speeches intended to preface and justify the destruction of his foes. The next day Saint-Just, his fearless and vigorous supporter, appeared in the tribune to secure the passage of the measure of proscription. Stormy scenes followed, but at last the intended victims, Barras, Tallien, and the men of action from the committee, with the skillful aid of Barère (q.v.), secured the arrest of Robespierre, and his younger brother Augustin, Couthon, Saint-Just, and Le Bas. All was not over, however, for Henriot with the National Guards of Paris rescued Robespierre and his friends and installed them at the city hall. Had Robespierre been able to decide quickly and act quickly, he might still have won; but indecision and inactivity gave his foes time to act and to attack him in the city hall. In the affray Robespierre shot himself or was shot in the jaw, his brother leaped from the window and broke his leg, and Le Bas committed suicide. The Convention reassembled and declared Robespierre and his friends and Henriot and the members of the Commune of Paris outlaws. This was the famous revolution of the 9th Thermidor. On the next day these men were all brought before the Revolutionary Tribunal and identified and immediately guillotined.

Bibliography. L. E. Hamel, *Histoire de Robespierre et du coup d'état du 9 thermidor* (3 vols.,

Paris, 1865–67), is the authoritative work, though inclined to be eulogistic. A. Aulard, *Les orateurs de la législative et de la convention* (Paris, 1885–86), deals with Robespierre as an orator, while his most important speeches are published in Morse-Stephens, *Principal Speeches of the Orators and Statesmen of the French Revolution* (Oxford, 1892). Consult also: M. de Lescure, *La société française pendant la Terreur* (Paris, 1882); Karl Brunnemann, *Maximilien Robespierre* (Leipzig, 1885); Victorien Sardou, *La maison de Robespierre: réponse à M. Hamel* (Paris, 1895); John Morley, in *Critical Miscellanies*, vol. i (London, 1898); José de Strada, *Robespierre et la révolution de l'humanité* (Paris, 1899); G. H. Lewes, *Life of Maximilian Robespierre, with Extracts from his Unpublished Correspondence* (3d ed., London, 1899); Hilaire Belloc, *Robespierre* (ib., 1902); C. F. Warwick, *Robespierre and the French Revolution* (ib., 1909). Carlyle's estimate of Robespierre in his *French Revolution* is unjust, as is that of some other historians of the period.

ROBIDOUX, rō'bē'dōō', Joseph Emery (1844–). A Canadian jurist. He was born at St. Philippe-de-Laprairie, Quebec, and was educated at Montreal College and McGill University. He was called to the bar in 1866, practiced his profession in Montreal, and in 1896 was elected president of the Canadian Bar Association. In 1884–92 and again in 1897–1900 he was a Liberal member of the Quebec Legislature. He was Provincial Secretary and afterward Attorney-General in the cabinet of Honoré Mercier (q.v.) and was Provincial Secretary in the cabinet of Félix Gabriel Marchand (q.v.). In 1900 he was appointed a puisne judge of the Superior Court of Quebec.

ROB'IN (originally a quasi-proper name), or Robin Redbreast. A name given affectionately in the first instance to a familiar little European song bird, which especially endears itself to the people by coming around the house and barns in winter, and later applied to the most common and familiar of American thrushes because of its friendly association with man and its red breast. The European robin is technically a warbler, of the family Sylviidæ. It is about 5.57 inches in length and of a remarkably round, plump form. (See Plate of Wrens, Warblers, etc.) The general color is olive brown, and the reddish-orange breast is a conspicuous characteristic, particularly of the male. The redbreast is a native not only of Europe but of the western temperate parts of Asia and of northern Africa. In the northern parts of Europe it is migratory, but never congregates in flocks. The attachment of pairs seems to extend beyond the mere breeding season (early spring) and to be stronger than in most birds. The nest is made of moss, dead leaves, and dried grass, lined with hair, often placed a little above the ground in a bush or in ivy on a wall; the eggs, five to seven in number, are white spotted with pale reddish brown. In winter the redbreast seeks the neighborhood of human habitations more than in summer, and becomes more bold and familiar. Its food ordinarily consists of worms, insects, and berries, and it readily becomes a pensioner at any door or window to which it is invited by the spreading of crumbs.

The American robin (*Merula migratoria*, or *Planesticus migratorius*) is the largest and most numerous of American thrushes and closely related to the European blackbird (q.v.). It is 10 inches long, olive gray, the top and sides of the head black, the chin and throat white, with black streaks, and the under parts orange. The female is of duller hues. Large flocks are to be seen in the Southern States in winter, where great numbers are killed for the table. The robin is a lively bird and a general favorite. The nest is built in trees or on rafters, stumps, or fence posts, of coarse grass and reeds, plastered internally with mud and lined with fine grasses. The eggs are four to five in number, uniform greenish blue. Two broods are produced in a year. Its food consists chiefly of worms and insects, but it enjoys berries and fruit and often makes sad havoc among cherries. The song of the robin, especially in the late afternoon or early evening, is very sweet and melodious, and it is a familiar friend on village lawns, where it searches for earthworms and cutworms with great zeal and cunning. In addition to western and southern subspecies a distinct but closely allied robin is found in Lower California, known as the St. Lucas robin (*Planesticus confinis*). It is much paler and a trifle smaller than the common robin. The Oregon robin (*Hesperocichla nævia*, or *Ixoreus nævius*) is a nearly allied species, called in books the varied thrush. The under parts are orange brown, but there is a broad black band across the breast. This species is abundant in the Pacific coast region from Alaska to Mexico.

ROB'IN ADAIR', called Aileen Aroon, or Eileen Aroon. A song based on the old Irish melody "Eileen Aroon," which dates back to the fifteenth or sixteenth century. The air has been repeatedly claimed by the Scotch and the Welsh, but is undeniably of Irish origin. Boieldieu introduced it into his *Dame Blanche*, and Beethoven arranged it for voices with pianoforte, violin, and violoncello (op. 108). Many songs were written to the old and familiar melody, including Burns's "Phillis the Fair," "Had I a Cave," and Moore's "Erin, the Smile and the Tear in thine Eye."

ROBIN GOOD'FELLOW. A supernatural being belonging to English folklore and mentioned by Shakespeare and his contemporaries. According to *A Midsummer Night's Dream* Robin is described as zealous in performance of household tasks for the sake of favorites, but inclined to play tricks on those with whom he is offended, or merely for his own diversion. He is said to take numerous shapes, into which he changes himself at will. He can also appear as a fire, and in this latter aspect is identical with the imaginary being called Will-o'-the-Wisp or Jack-o'-Lantern. He is further identified with the fairy Puck, originally a term applied to elves in general. Robin Goodfellow is akin to the German house sprites called kobolds or to the Scandinavian fairy Nissë God-dreng.

ROBIN HOOD. A legendary English outlaw. See Hood, Robin.

ROB'INS, Benjamin (1707–51). An English mathematician and military engineer, born at Bath. In 1728 he confuted a dissertation by Johann Bernoulli, which attempted to establish Leibnitz's theory on the laws of motion, a victory which gained him considerable reputation. For some years he taught pure and applied mathematics, but later became an engineer, devoting himself to the construction of mills and bridges, and commenced the series of experiments on the resisting force of the air to

projectiles, which gained him much celebrity. In 1734 he demolished, in a treatise entitled *A Discourse Concerning the Nature and Certainty of Sir Isaac Newton's Method of Fluxions*, the objections brought by Bishop Berkeley against Newton's principle of ultimate ratios. His valuable work, *New Principles of Gunnery* (1742), produced a complete revolution in the art to which it relates. (See BALLISTICS.) In this work Robins suggested two new methods for estimating the velocity of balls. He also discovered and explained the curvilinear deflection of a ball from a vertical plane. He wrote several dissertations on his experiments and was in 1747 awarded the Copley medal. In 1749 he was appointed engineer in general to the East India Company and planned the defenses of Madras. His mathematical works were collected after his death and, along with the details of his latest experiments in gunnery, were published under the title *Mathematical Tracts* (1761). Robins also revised and edited Anson's *Voyage Round the World* (1740–44), and contributed extensively to the *Transactions* of the Royal Society.

ROBINS, ELIZABETH (MRS. GEORGE RICHMOND PARKES) (C. E. RAIMOND) (?–). An actress and author, born in Louisville, Ky., educated in Zanesville, Ohio, but resident principally in England. As an interpreter of the characters of Ibsen's plays, she was early and eminently successful. Her strong convictions as a feminist and as a woman suffragist not infrequently express themselves in her books, which include, notably: *George Mandeville's Husband* (1894); *Below the Salt* (1896); *The Open Question* (1898); *The Magnetic North* (1904); *Votes for Women* (c.1906), a play; *The Convert* (1907); *The Florentine Frame* (1909); *Where Are You Going to?* (1912); *My Little Sister* (1912; new ed., 1915); *Way Stations* (1913), a collection of lectures and articles dealing with the woman's movement.

ROBINS, MARGARET DREIER (?–). An American social economist, born in Brooklyn, N. Y. In 1905 she was married to Raymond Robins (q.v.). She was a founder of and was connected with the Women's Municipal League of New York in 1903–04, served as president of the New York Women's Trade Union League in 1905, of the Chicago Women's Trade Union League after 1907 and also of the National Women's Trade Union League after 1907, and in 1908 became a member of the executive board of the Chicago Federation of Labor. When the Progressive party was organized in 1912 she became a member of the Cook Co. (Ill.) Central Committee and of the State Executive Committee of the party.

ROBINS, RAYMOND (1873–). An American social economist. He was born on Staten Island, N. Y., and graduated LL.B. from Columbian (now George Washington) University in 1896. He served as superintendent of the Chicago Municipal Lodging House in 1902–05, as head worker of the Northwestern University Settlement in 1903–05, and as a member of the Chicago Board of Education in 1906–09. As a social-service expert he was connected in 1911–12 with the Men and Religion Forward Movement, in behalf of which he made a world tour in 1913. Robins became chairman of the State Central Committee of the Progressive party in Illinois, and in 1914 was unsuccessful as a candidate for United States Senator. He became widely known as an advocate of organized labor. For his wife, see ROBINS, MARGARET DREIER.

ROBINS, THOMAS (1868–). An American inventor and manufacturer. He was born at West Point, N. Y., and attended Princeton in 1887–89. His chief invention is a belt conveyor, which is largely used for carrying ore and coal and for which he was awarded a gold medal at the Paris Exposition in 1900. He became president of the Robins Conveying Belt Company and of the Robins New Conveyor Company. In September, 1915, he became a member of the newly created United States Naval Advisory Board.

ROBIN SNIPE. A gunner's name locally applied to various red-breast shore birds, especially to the dowitchers (q.v.). See KNOT; and Plate of BEACH BIRDS.

ROB'INSON. A city and the county seat of Crawford Co., Ill., 45 miles southwest of Terre Haute, Ind., on the Cleveland, Cincinnati, Chicago, and St. Louis and the Illinois Central railroads (Map: Illinois, J 8). It contains an Elks home and fine government, courthouse, and high-school buildings. Robinson is situated in a productive agricultural region. Oil is found here in abundance, and there are a large refinery and an oil-well supply factory. Pop., 1900, 1683; 1910, 3863.

ROBINSON, AGNES MARY FRANCES (MADAME DUCLAUX, formerly MADAME DARMESTETER) (1857–). An English poet and essayist, born at Leamington. She studied at University College for seven years, devoting herself specially to Greek literature. In 1888 she married James Darmesteter (q.v.), remaining in Paris after his death in 1894. In 1901 she married Professor Duclaux, director of the Pasteur Institute. Among her works are: *A Handful of Honeysuckles* (1878); *The Crowned Hippolytus*, translation from Euripides, and other poems (1881); *Arden* (1883), a novel; *Emily Brontë* (1883); *The New Arcadia* (1884); *Margaret of Angoulême, Queen of Navarre* (1885); *An Italian Garden* (1886); *Songs, Ballads, and a Garden Play* (1888); *End of the Middle Ages* (1888); *Retrospect* (1893); *A Mediæval Garland* (1897); *Life of Renan* (1897); *The French Ideal* (1911); *Twentieth Century French Writers* (1914). Much of her work is scattered through the *Revue de Paris* from 1898 onward, and some volumes were published in French.

ROBINSON, BENJAMIN LINCOLN (1864–). An American botanist, born at Bloomington, Ill. He graduated at Harvard in 1887 and later studied at Strassburg and Bonn. In 1892 he was appointed curator of the Gray Herbarium at Harvard and in 1899 became also Asa Gray professor of systematic botany there. He served as president of the Botanical Society of America in 1900. Robinson gained a reputation for his taxonomic work and as collaborator and editor of Gray's *Synoptical Flora of North America* (1892–97).

ROBINSON, BEVERLEY (1723–92). An American Loyalist, born in Virginia. He was the son of John Robinson, president of the Council of Virginia in 1734. He served as major under Wolfe at Quebec in 1759, and soon afterward gained possession, through marriage with a daughter of Frederick Philipse, of large tracts of land along the Hudson. At first he sided with the colonists against England, but, disapproving of the separation, he removed to New York in 1776 and organized the Loyal American

Regiment, of which he became colonel. Later his property, together with that of his wife, was confiscated by the State of New York. His country house (the Philipse manor house, near Tarrytown) was the scene of Arnold's preliminary arrangements for the surrender of West Point, Robinson himself being implicated in the plot. After the war he retired, first to New Brunswick and later to Thornbury, England, where he lived until his death. He was the father of Sir F. P. Robinson (q.v.).

ROBINSON, Charles (1818–94). The first Governor of the State of Kansas. He was born in Hardwick, Mass., studied for a time in Amherst College, and in 1843 graduated at the Berkshire Medical School. Six years later he accompanied an emigrant train across the plains to California. He settled in Sacramento and remained there for two years, working as a miner, as a restaurant keeper, and as editor of the *Settler's and Miner's Tribune.* In 1850 he was elected to the Legislature, in which he proved an able champion of the settlers, and also did much to prevent California from becoming a slave State. Returning to Massachusetts, he edited the Fitchburg *News* for two years, and in 1854 was chosen by the Emigrant's Aid Society to go to Kansas and help save that Territory for freedom. He quickly became the leader of the Free-State party, and was made chairman of the Executive Committee and commander of the Kansas Volunteers. It was his policy to avoid any resistance to the United States government, but to ignore the laws passed by the bogus proslavery Legislature of 1855. He took an active part in the Wakarusa War, and in 1855 was a member of the Topeka Convention which drew up a free-State constitution. In the following year he was elected Governor under this constitution, but was arrested on a charge of treason and usurpation of office. He was indicted by the Federal Grand Jury, but after an imprisonment of several months he was tried for usurpation and, being acquitted, was released. Two years later he was reëlected Governor by the Free-State party; in 1859 he was again reëlected under the Wyandotte constitution, and in 1861 he became the first Governor of the State. He bequeathed most of his property to his wife, but stipulated that on her death it should go to the Kansas State University, which owes its existence very largely to their efforts. He published *The Kansas Conflict* (New York, 1892). Consult F. W. Blackmar, *Charles Robinson* (new ed., Topeka, 1907), and L. W. Spring, *Kansas: Prelude to the War for the Union* (rev. ed., Boston, 1907).

ROBINSON, Charles Mulford (1869–). An American authority on civic design, born at Ramapo, N. Y. After graduating from the University of Rochester in 1891 he was an editor of the Rochester *Post-Express* until 1902, served as an associate editor on the Philadelphia *Ledger* in 1904, and as contributing editor on the *Survey* in 1907–12. He also contributed to the *Architectural Record.* Having made a special study of municipal æsthetics and town planning, he submitted plans for beautifying Denver, Colorado Springs, Honolulu, Oakland, Los Angeles, and Fort Wayne, and in 1913 became professor of civic design—the first chair of the sort in the United States—at the University of Illinois. Robinson is author of *The Improvement of Towns and Cities* (1901; 8th ed., 1913); *Modern Civic Art* (1903; 4th ed., 1912); *The Call of the City* (1908); *The Width and Arrangement of Streets* (1911); *City Planning* (1915).

ROBINSON, Charles Seymour (1829–99). An American Presbyterian clergyman, born at Bennington, Vt. He studied at Williams College and at Union and Princeton theological seminaries. Afterward he had pastorates in Troy and Brooklyn until 1868, when he took charge of the American chapel in Paris. This he organized into a church. Returning to the United States in 1871, he served successively the Madison Avenue and the Thirteenth Street Presbyterian churches, New York. He published: *Studies in the New Testament* (1880); *The Pharaohs of the Bondage and the Exodus* (1887); *Simon Peter: His Life and Times* (1888); and a number of hymnals that have been widely used, including *Laudes Domini* (1884).

ROBINSON, Christopher (1828–1903). A Canadian lawyer. He was born in Toronto, the son of Sir John Beverley Robinson, and was educated at Upper Canada College and at the University of Trinity College, Toronto. He was called to the bar in 1850, practiced his profession in his native city, was reporter to the Court of Queen's Bench (1856–72), and edited the law reports (1872–85). He took high rank as counsel, and was engaged upon a large number of important cases, among which were the trial of Louis Riel (q.v.) for high treason in 1885, the contest between the Dominion government and the Canadian Pacific Railway in 1889–90, and the famous Bering Sea controversy (q.v.) with the United States in 1893, in which he was one of the counsel retained by the British government. He declined the highest judicial appointments.

ROBINSON, Clifford William (1866–). A Canadian statesman. He was born in Moncton, New Brunswick, and was educated at Mount Allison University. Admitted to the bar in 1893, he practiced his profession in Moncton and became a leader of the provincial bar. He was an unsuccessful Liberal candidate for the House of Commons at Ottawa in 1896, was elected to the Provincial Assembly in 1897, was Speaker thereof (1901–07), Provincial Secretary (1907), Premier of New Brunswick (1907–08), and in 1908 was elected leader of the Liberal opposition.

ROBINSON, Sir Clifton (1848–1910). An English engineer, born at Birkenhead. At an early age he joined the engineering staff of G. F. Train, who built the first tramway in Europe at Birkenhead and by whom he was employed in the United States in 1866. In 1871 he had charge of the laying of street-car tracks in Cork, Ireland, in 1875 became general manager of the Bristol tramways and later manager of the Edinburgh tramways, superintended the construction of a traction system at Los Angeles, Cal., and designed and constructed the London United Electric Tramway System and similar systems for other cities. Robinson took part in the construction of the London tubes in 1902, and in 1906 put into operation a system of through bookings between tramways and other railways in the same city. In 1905 he was knighted. He wrote much on the subject that he had made his specialty.

ROBINSON, Edward (1794–1863). An American biblical scholar, born at Southington, Conn. He graduated at Hamilton College, Clinton, N. Y.,

in 1816. Later he studied at Andover, Mass., and at Halle and Berlin. On his return to the United States he was made professor extraordinary of sacred literature at Andover, but in 1833 his health broke down and he moved to Boston. From 1837 until his death he was professor of biblical literature in Union Theological Seminary. He traveled in Palestine in 1838 and 1852 with the famous missionary, the Rev. Eli Smith. The result of their first visit was a work entitled *Biblical Researches in Palestine and Adjacent Countries* (3 vols., Boston and London, 1841; Ger. ed., Halle, 1841; 2d ed., enlarged, 1856). This work gained for Robinson the gold medal of the Royal Geographical Society (1842). Robinson edited and translated *Buttmann's Greek Grammar* (1823; 3d ed., 1851); Winer's *Grammar of New Testament Greek* (1825), with Moses Stuart; Wahl's *Clavis Philologica Novi Testamenti* (1825); *Gesenius' Hebrew Lexicon* (1836; 5th ed., 1854); *Greek and English Lexicon of the New Testament* (1836; 2d ed., 1847); *Greek Harmony of the Gospels* (1845; 2d ed., 1851); *English Harmony of the Gospels* (1846). He founded the *Biblical Repository* in 1831 and edited it for four years. In 1843 he established the *Bibliotheca Sacra*. Consult R. D. Hitchcock, *The Life, Writings, and Character of Edward Robinson* (New York, 1863).

ROBINSON, Edward (1858–). An American archæologist, writer, and museum official. He was born in Boston and graduated (1879) from Harvard, where after five years' study in Europe, especially in Greece and at Berlin, he served as lecturer on classical archæology (1893–94, 1898–1902). He was curator of classical antiquities in the Boston Museum of Fine Arts from 1885 to 1902 and then for three years director of the museum. Appointed assistant director of the Metropolitan Museum of Art, New York, in 1905, he succeeded Sir Caspar Purdon Clarke (q.v.) as director in 1910. Under his administration this museum entered on a period of great expansion. He arranged collections of classical antiquities and casts in various museums, notably in Boston and New York, and prepared numerous catalogues and contributed many articles on archæological subjects to the *Bulletin of the Metropolitan Museum* and to the leading magazines. He became a Knight of the Prussian Order of the Red Eagle, third class, and a member of the Imperial German Archæological Institute, and received honorary degrees from Aberdeen and Columbia universities.

ROBINSON, Edward Van Dyke (1867–1915). An American economist, born at Bloomington, Ill. He graduated from the University of Michigan in 1890 and at Leipzig (Ph.D.) in 1895. In 1892–93 and from 1895 to 1907 he was superintendent and principal of public schools in Michigan, Illinois, and Minnesota. He lectured on commercial geography in summer sessions at the University of Minnesota in 1901–02 and at the University of Chicago in 1908, and at the former institution held the chair of economics from 1907 to 1915, when he accepted a similar chair at Columbia. He was author of: *Nature of the Federal State* (1893); *War and Economics* (1900); *Division of Government Power in Ancient Greece* (1901); *Text Book of Commercial Geography* (1909); *Railroad Taxation in Minnesota: Analysis of the Gross Earnings Tax* (1912); *The Cost of Government, National, State, and Local* (1912); *Early Economic Conditions and the Development of Agriculture in Minnesota* (1915).

ROBINSON, Edwin Arlington (1869–). An American poet, among the best of his day. He was born at Head Tide, Me., and studied at Harvard University from 1891 to 1893. His work, intellectual, sincere in feeling, distinctively American in tone and point of view, and free from all that is trivial and meaningless, won the regard of the discriminating. He was honored by membership in the National Institute of Arts and Letters. His volumes of verse include: *The Torrent and the Night Before* (1896); *The Children of the Night* (1897); *Captain Craig* (1902; with added poems, 1915); *The Town Down the River* (1910). In 1914 appeared *Van Zorn*, a comedy, and in 1915 *The Porcupine*, a tragic drama.

ROBINSON, Ezekiel Gilman (1815–94). An American Baptist clergyman, theologian, and educator, born at Attleboro, Mass., and educated at Brown University and at Newton Theological Institution. He preached at Norfolk, Va., and at Cambridge, Mass., was professor of Hebrew and biblical interpretation in the Western Theological Seminary (Covington, Ky.), and in 1849 accepted a call to a Cincinnati church. Three years later he was appointed professor of theology in Rochester Theological Seminary and in 1860 was made its president. From 1872 to 1889 he was president of Brown University, and from 1893 to his death he occupied the chair of ethics and apologetics in Chicago University. He edited the *Christian Review* from 1859 to 1864 and published: *Yale Lectures on Preaching* (1883); *Principles and Practice of Morality* (1888); *Christian Theology* (1894). Consult *Ezekiel Gilman Robinson: Autobiography*, edited by E. H. Johnson (New York, 1896).

ROBINSON, Frederic Cayley (1862–). An English landscape and figure painter. He was born at Brentford, Middlesex, and studied at the Royal Academy Schools in London, under Bouguereau and Ferrier in Paris, and in Italy, but seems to have been most influenced by Puvis de Chavannes. Robinson's art, however, may be identified more closely with the work of the Pre-Raphaelites than with modern tendencies. Especially is this true in the carefully drawn, minutely finished details and in the elongated, quaintly mediæval aspect of the figures. He possesses imaginative qualities of a high order, and his paintings contain a serious ethical appeal. To his earlier period belong such works as: "The Ferry" (1891); "In a Wood so Green" and "The Fishers" (1893); "Souvenir of a Past Age" (Adelaide, Australia, 1895); "Close of the Day" (1896). More recent examples are: "The Foundling" and "Romance" (1900); "Fata Morgana," "Twilight," "The Deep Midnight" (1902–06); "The Farewell," "Waning Day" (1910); "The Fisherman" (Italian National collection, Rome); "The Death of Abel" (Luxembourg Gallery, Paris).

ROBINSON, Frederick John. See Ripon, Earl of.

ROBINSON, Sir Frederick Philipse (1763–1852). An English general, son of the Loyalist Beverley Robinson (q.v.), born on the Philipse Manor, on the Hudson. In 1777 he entered his father's Loyal Regiment, fought at Horseneck and at Stony Point, where, in July, 1779, he was taken prisoner, was released in November, 1780, and in September, 1781, was present at

the capture of New London. At the close of the Revolution his property was confiscated and he went to England. Robinson saw service in the West Indies in 1794, becoming a major in September of that year, and in 1812, against Wellington's wishes, was sent with the rank of colonel to the Peninsula, where he commanded a brigade and distinguished himself by intrepid bravery at Vittoria and San Sebastian and at the battle of the Nive, being several times wounded. In 1814 he was promoted to the rank of major general, and he was sent in the same year to Canada with a brigade. He took part in the attack on Plattsburg and bitterly resented General Prevost's order to retire. He was knighted in 1815 and for a few weeks in that year acted as Provincial Governor of Upper Canada, whence in 1816 he was transferred to the West Indies. Robinson became general in 1841.

ROBINSON, Geoffrey (1874–). An English journalist. He was educated at Eton and at Magdalen College, Oxford, and in 1898 became a fellow of All Souls. After being head clerk in the Colonial Office he was from 1901 to 1905 private secretary to Lord Milner in South Africa. In 1905–10 he proved himself a brilliant journalist as editor of the Johannesburg *Star* and then became correspondent of the London *Times* in South Africa. In 1912, when the control of the *Times* changed hands, he became its editor.

ROBINSON, Henry Crabb (1775–1867). An English man of letters. He was born at Bury St. Edmunds and was early apprenticed to a lawyer in London. He studied on the Continent, acquired a thorough knowledge of German philosophy and literature, and made the acquaintance of Schiller, Goethe, Wieland, and others. In 1808 he became special Spanish correspondent of the London *Times*, of which he subsequently became a regular editorial writer and literary critic. Among his literary friends were Wordsworth, Lamb, Coleridge, Southey, Flaxman, Clarkson, and Charles G. Loring, a leader of the Boston (Mass.) bar. He was a brilliant conversationalist and raconteur, and at his breakfasts the best English literary men of his day assembled. His *Diary* (35 vols.), *Journals* (30 vols.), and *Reminiscences* (36 vols.) are still in manuscript, except for a group of brief selections published by Thomas Sadler (1869). He was a liberal patron of art and education, was one of the first members of the Athenæum Club, and was one of the founders of the Athenæum Club and of University College, London. Consult L. H. Vincent, *Dandies and Men of Letters* (Boston, 1913).

ROBINSON, Sir Hercules George Robert, first Baron Rosmead (1824–97). A British colonial governor. He was educated at Sandhurst, but in 1846 left the army for office in the Irish Board of Public Works, where he proved an able administrator during the famine of 1848. In 1855 he left Montserrat, of which he was President, to become Lieutenant Governor of St. Christopher, and five years later was knighted for the introduction of coolie labor and transferred from the West Indies and made Governor of Hongkong. Afterward he was appointed Governor of Ceylon (1865), of New South Wales (1872), and of New Zealand (1879); in 1880 he succeeded Sir Bartle Frere as High Commissioner of South Africa, a post which he held until 1889. His policy was strongly in favor of responsible colonial government, and the success of his first administration was evidenced by his reappointment in 1895. Moreover, he encouraged in every possible way the idea that the only true basis for peace in South Africa was friendly coöperation between the British and the Dutch. But he broke openly with Cecil Rhodes at the time of the Jameson raid and in his anxiety to arrange the release of the raiders refused to obey an order by Joseph Chamberlain, Secretary of State for the Colonies, to settle immediately the status of the Uitlanders. His influence probably postponed the outbreak of hostilities. Robinson became Baron Rosmead a year before his death.

ROBINSON, James Harvey (1863–). An American historian, born in Bloomington, Ill. After graduating from Harvard in 1887 he studied history at Freiburg, Germany, and received the degree of Ph.D. in 1890. For a year he lectured on European history at the University of Pennsylvania, and after 1892 he taught at Columbia as associate professor and (from 1895) as professor of history. Professor Robinson was a pioneer in what has become known as the New History. His textbook *An Introduction to the History of Western Europe* (1903) had a profound effect upon the teaching of European history in the United States and Canada. Its author believes judicious selection and intelligent proportion to be the two great desiderata in the writing and teaching of history. According to his view most of the historians of the old school, contenting themselves with writing mainly about politics and war, have neglected a vast range of human interests—social, scientific, intellectual, artistic, and have failed to draw freely upon the "allies of history"—anthropology, sociology, political science, and natural science. Professor Robinson's course at Columbia, "The History of the Intellectual Class in Europe," was at its inception unique in American universities. As its basis two principal theories were taken: (1) the great changes that have come about in the world are of comparatively recent origin as measured by the antiquity of man, and (2) the ideas and institutions of the present are largely the result of an unreflective past, but because this is not generally understood we cling to them tenaciously. By laying most emphasis on the thought element in world changes, Professor Robinson believes that a true outlook on history would be gained, thereby tending to make one progressive rather than conservative. He coöperated in editing *Translations and Reprints from the Original Sources of European History.* He published besides: *The German Bundesrath* (1891); *Petrarch, the First Modern Scholar and Man of Letters* (1898; 2d ed., rev., 1914), with W. H. Rolfe; *Readings in European History* (2 vols., 1904–06); *The Development of Modern Europe* (2 vols., 1907–08), with C. A. Beard; *Readings in Modern European History* (2 vols., 1908–09), also with Beard; *The New History* (1911); *Outlines of European History* (2 vols., 1912–14), with others.

ROBINSON, J(oseph) Armitage (c.1859–). An English theologian. He was educated at Christ's College, Cambridge, of which he was fellow in 1881–89 and honorary fellow after 1905. He took Anglican orders in 1881 and 1882 and from 1888 to 1892 was vicar of All Saints Church, Cambridge. While Nor-

risian professor of divinity at Cambridge (1893–99) he received honorary degrees from Göttingen and Halle. He was prebendary of Wells Cathedral in 1894–99, rector of St. Margaret's, Westminster, in 1899–1900, canon of Westminster in 1899–1902, and dean of Westminster from 1902 to 1911, when he became dean of Wells. In scholarship his most important work was on the early Church. He published: *A Collation of the Athos Codex of the Shepherd of Hermas* (1888); *Appendix to the Apology of Aristides* (1891); *The Philocalia of Origen* (1893); *Euthaliana* (1895); *Unity in Christ* (1901); *The Study of the Gospels* (1902); *Some Thoughts on the Incarnation* (1903); *Commentary on the Epistle to the Ephesians* (1903; 2d ed., 1904); *On the Athanasian Creed* (1905); *The Vision of Unity* (1908); *The Advent Hope in St. Paul's Epistles* (1911); *Holy Ground* (1914), sermons.

ROBINSON, John (c.1576–1625). The minister of the Pilgrim Fathers. He was born probably in Gainsborough, Lincolnshire, England, and was educated at Corpus Christi College, Cambridge. He took orders in the Church of England and worked near Norwich, but was suspended for nonconformity by the Bishop about 1603. He became a Separatist soon after and united himself with a congregation at Scrooby. After several unsuccessful attempts to emigrate this congregation reached Amsterdam between April and August, 1608. Here Robinson was chosen pastor. They removed to Leyden, reaching there in May, 1609. Robinson, together with three friends, bought a large house and lived as pastor of a growing Separatist congregation. He carried on many controversies with Anglican and Puritan opponents and exerted a strong influence over the English exiles in Amsterdam. The prosperity of the congregation was pronounced, but Robinson foresaw that there was no final hope of permanence for his church in Holland. Therefore, together with Cushman, Bradford, Brewster, and others, he organized as early as 1617 a movement to emigrate to America, which was consummated by the removal of the majority of the stronger members to Plymouth in 1620. Robinson remained behind with the weaker and older members, hoping to follow the majority in time. He was hindered chiefly by the financial supporters of the movement in England, who feared his principles of separation. He died in Leyden and was buried March 4, 1625, in Peter's Church. The location of the house in which he lived in Leyden is marked by a tablet, and a beautiful bronze memorial is affixed to Peter's Church, where he is buried. His works were collected and published in three volumes with an introductory biographical study, by Robert Ashton (London and Boston, 1851). His most important publications were: *A Justification of Separation from the Church of England* (1610); *Of Religious Communion* (1614); *Essays or Observations Divine and Moral* (1625; several subsequent editions). Consult: O. S. Davis, *John Robinson: Pilgrim Pastor* (Boston, 1903); Champlin Burrage, *New Facts Concerning John Robinson* (Oxford, 1910); and the literature under Pilgrim Fathers and Puritans.

ROBINSON, Sir John Beverley (1791–1863). A Canadian jurist and statesman. He was born in Berthier, Lower Canada (now Quebec), and was educated at Dr. (afterward Bishop) Strachan's school at Kingston, Upper Canada. He studied law and became Acting Attorney-General of Upper Canada at 21, being admitted to the bar the same year. He served as a volunteer during the War of 1812. In 1815 he was appointed Solicitor-General and in 1818 became Attorney-General, in which position he continued until his appointment as chief justice of Upper Canada in 1829. He was elected a Conservative member of the Upper Canada Assembly in 1821, representing York (now Toronto) for several years. During the agitation for responsible government which culminated in the rebellion of 1837–38 Robinson was the chief opponent of the Reformers and the trusted guide of the Conservatives, then ruled by the Family Compact, a clique of office-holding Tories. (See Political Parties, *Canada.*) He strongly opposed the union of Upper and Lower Canada in 1841, issued an able political pamphlet against it, and went to England to influence the authorities to prevent it. He retired from political life the same year, retaining the office of chief justice, which he held until his death. As a jurist he was upright and able; but in 1838 his charge to the grand jury at the trial of the Reformers Samuel Lount and Peter Matthews (qq.v.) for high treason excited strong criticism by reason of the political passions of the time. He was made Baronet in 1850. Consult J. C. Dent, *Canadian Portrait Gallery* (Toronto, 1880).

ROBINSON, John Cleveland (1817–97). An American soldier, born in Binghamton, N. Y. He graduated at West Point in 1839 and served with distinction under Generals Taylor and Scott in the Mexican War. In 1853 and 1854 he served against the Indians in Texas and in 1857 and 1858 was with the expedition sent out to Utah against the Mormons. When the Civil War broke out, he was in command of Fort McHenry at Baltimore and prevented it from being seized by Confederate sympathizers. Afterward he helped muster in troops at Columbus, Ohio, and Detroit, Mich. As brigadier general of volunteers, he fought with the Army of the Potomac in the Peninsular campaign, at Fredericksburg, Chancellorsville, Gettysburg, and in the battles of the Wilderness. At Spottsylvania Court House he was wounded and incapacitated for further service. In 1872 he was elected Lieutenant Governor of New York. In 1877 and again in 1878 he was chosen commander in chief of the Grand Army of the Republic, and in 1887 he was made president of the Society of the Army of the Potomac.

ROBINSON, Sir Joseph Benjamin (1840–). A South African capitalist, born in Cradock, Cape Colony. He was a farmer, wool buyer, and general trader until 1867, when diamonds were discovered on the Orange River. He bought diamonds and diamond-bearing land at Kimberley and elsewhere and in 1880 was mayor of Kimberley. In the Cape Parliament, where he represented West Griqualand for four years, he secured the passage of the Diamond Trade Act. In 1886, when gold was discovered, he bought the Langlaagte and Randfontein fields. He refused to join the combination of gold-mine capitalists and sided with Kruger against the grasping reformers. He was made Baronet in 1908.

ROBINSON, Joseph Taylor (1872–). An American legislator, born at Lonoke, Ark. He studied at the University of Arkansas, was admitted to the bar in 1895, and thereafter

practiced law at Lonoke. He was a member of the General Assembly of Arkansas in 1895 and was a presidential elector in 1900. From 1903 to 1913, when he resigned, he represented the Sixth Arkansas District in the United States House of Representatives, was then inaugurated Governor of his State, but resigned a few days later to accept a seat in the United States Senate, to which he was elected as successor to Jeff Davis for an unexpired term ending in 1919.

ROBINSON, MARY (DARBY) (1758–1800). An English actress and royal favorite, known as Perdita. She was born at Bristol and in 1774 was married to Thomas Robinson, a London clerk. In 1778 in the rôle of Perdita in Garrick's production of the *Winter's Tale* she captivated the fancy of the Prince of Wales (afterward George IV), and in exchange for a royal bond of £20,000, payable when the Prince became of age, Mary became his mistress. Later she found herself deserted and died at last in poverty. She wrote verse, some of which referred to her royal lover. Reynolds, Gainsborough, Cosway, Hoppner, and Romney painted her portrait.

ROBINSON, ROBERT (1735–90). An English preacher and hymn writer, born at Swaffham in Norfolk. Having come under the influence of Whitefield, he began to preach. In 1761 he became minister at the Stone Yard Baptist Chapel in Cambridge, built a new church (1764), and drew large congregations. Though nominally a Baptist, Robinson was very liberal in his religious views; he became in fact a Unitarian. He published numerous books and pamphlets on theological questions and the slave trade, and wrote several hymns, of which one, "Come Thou Fount of Every Blessing," has a permanent place.

ROBINSON, STUART (1814–81). An American Presbyterian clergyman. He was born at Strabane, near Londonderry, Ireland, but early came to America and graduated at Amherst College in 1836. He studied theology at Union Seminary (Virginia) and at Princeton Seminary. Afterward he was a pastor in the South until 1856, then professor of Church polity and pastoral theology in the Presbyterian Theological Seminary at Danville, Ky., and in 1858 became pastor of a church in Louisville, Ky. *The True Presbyterian*, a paper edited by him, was suppressed by the military authorities on the charge of disloyalty to the Union. Robinson thereupon removed to Toronto and remained there until the close of the war. In 1866 he was expelled from the General Assembly meeting in St. Louis, as a member of the Louisville Synod that had adopted the "Declaration and Testimony," a paper protesting against the political deliverances of the five preceding General Assemblies as "unwise, unconstitutional, and unscriptural." In 1869 the Synod of Kentucky under his lead united with the General Assembly of the Southern Presbyterian Church and chose him their moderator. Later he was prominent in framing the constitution and promoting the success of the General Presbyterian Alliance. He published *Slavery as Recognized in the Mosaic Civil Law, and as Recognized also and Allowed in the Abrahamic, Mosaic, and Christian Church* (1865) and *Discourses of Redemption* (1866).

ROBINSON, THEODORE (1852–96). An American landscape painter. He was born at Irasburg, Vt., and studied under Carolus Duran and Gérôme in Paris and at Giverney with Monet. Robinson was a foremost representative of the Impressionist school (see IMPRESSIONIST PAINTING) in America, but such was the effect of his early training that he rendered form in a way easy to understand. His technique is able, the execution brilliant and original. His works are mostly in private possession. Among the best known are: "A Bridge," "In the Sunlight" (1892), Grand Union Hotel, New York; "Washing Day," "On the Tow-Path," and "Afternoon Shadows" (1894); "West River Valley" and "October Afternoon" (1896). The Metropolitan Museum, New York, possesses three examples, including "Giverney" and the "Girl with Cow."

ROBINSON, THERESE ALBERTINE LUISE (pen name TALVJ) (1797–1870). A cosmopolitan author, daughter of Prof. Ludwig H. von Jakob. She was born at Halle, Germany, lived for a time with her father in Russia, and after her marriage (1828) to Prof. Edward Robinson (q.v.), accompanied him to the United States, where she studied the languages of the aborigines. Mrs. Robinson wrote extensively both in English and in German. Among her publications are German translations (under the signature Ernest Berthold) of Scott's *Black Dwarf* and *Old Mortality* (1822); *Psyche* (1824), a volume of tales; a German translation of Servian folk songs (1825–26); *Charakteristik der Volkslieder germanischer Nationen* (1840); *Die Unächtheit der Lieder Ossians* (1840); *Die Colonisation von Neu-England* (1847); tales in German—*Heloise, Life's Discipline*, and *The Exiles*, translated into English by her daughter (1850–53); a volume of reviews, entitled *Historical View of the Languages and Literature of the Slavic Nations* (1850); *Fifteen Years: A Picture of the Last Century* (1870). Her *Gesammelte Novellen* appeared in two volumes in 1874. A memorial volume by L. Wagner, *Biographische Skizze* (Pressburg, 1897), appeared on the one hundredth anniversary of her birth.

ROBINSON, WILLIAM ERIGENA (1814–92). An Irish-American journalist and politician, born in Unagh, County Tyrone, Ireland. After obtaining a classical education he emigrated to the United States. He graduated at Yale in 1841, then became associate editor of the New York *Tribune*, and from 1844 to 1848 was its Washington correspondent, writing under the nom de plume of Richelieu. He subsequently edited several other papers and from 1854 to 1862 practiced law in New York. In the latter year President Lincoln appointed him assessor of internal revenue for the third New York district, and after holding this office for four years he was in 1866 elected to Congress, where by his determined advocacy he secured the passage in 1868 of a bill protecting abroad the rights of naturalized as well as native-born citizens. Previous to this (1847) he had taken an important part in organizing a movement for the relief of Ireland during the great Irish famine and had secured the passage of the bill sending the United States warship *Macedonian* with provisions to his native land. He was reëlected to Congress in 1880 and 1882.

ROBINSON, WILLIAM S. (1861–). An American landscape painter, born at East Gloucester, Mass. He studied in Boston and later in France and Holland. He was instructor at

the Maryland Institute, Baltimore (1885–89), at Drexel Institute, Philadelphia (1891–93), at the Pennsylvania Academy of Fine Arts, Philadelphia (1892–99), and at Teachers College, Columbia University (1894–1904). Among his best works, which are good in color with a solid yet pleasing presentation, are: "The Golden Bough" (1908, Carnegie Institute, Pittsburgh); "Cliff Shadows" (1912); "White Birches" (1913); "Whiteface Chasm, Monhegan" (1913); "September" (1915). He made his residence in New York and became (1911) a member of the National Academy of Design, in the exhibitions of which he exhibited regularly.

ROBINSON CRUSOE. A romance by Daniel Defoe (1719), founded on the actual adventures of Alexander Selkirk during his four years' residence in the island of Juan Fernandez. It is one of the most famous of all stories of adventure. For special study, consult the reprint edited by Austin Dobson (London, 1883), with a bibliography.

ROBLIN, rŏb'lĭn, Sir Rodmond Palen (1853–). A Canadian statesman. He was born in Prince Edward County, Ontario, and was educated at Albert College, Belleville. In 1880 he went to Manitoba, where he farmed extensively, and later became a grain merchant at Winnipeg. After several years in municipal life he was elected a Conservative member of the Manitoba Legislature. His ability in debate and political leadership brought him in 1900 the premiership of Manitoba. In this office he continued uninterruptedly until 1915, when evidence of fraud, of which he was not known to be personally cognizant, in connection with government building contracts compelled the resignation of his ministry. During his premiership he held also at different times the offices of Minister of Agriculture, Provincial Secretary, and Land Commissioner. He was an extensive promoter of industrial enterprises and strongly opposed the Taft-Fielding Reciprocity Agreement in 1911. He was knighted (K.C.M.G.) in 1912.

ROB ROY. The popular name of Robert MacGregor or Campbell (1671–1734), a celebrated Scottish outlaw. He was born in Buchanan Parish, Stirlingshire, and was the second son of Donald MacGregor, of Glengyle, by a daughter of Campbell of Glenneaves. In Gaelic the name Roy signifies "red" and was applied to him from his ruddy complexion and color of hair. Rob Roy assumed the maternal name of Campbell in consequence of the outlawry of the clan MacGregor by the Scottish Parliament. He received a fair education and in his youth was distinguished for his skill in the use of the broadsword, in which the uncommon length of his arms was of much advantage. Like many of the Highland proprietors of the period, he was engaged in grazing and rearing black cattle for the English market, but his herds were so often stolen by raiders that, to protect himself, he maintained a party of armed men, also protecting his neighbors' flocks, in return for which he levied a tax which went under the name of black mail. By marriage he acquired the estates of Craig Royston and Inversnaid, near the head of Loch Lomond. In consequence of losses incurred in unsuccessful speculations in cattle, for which he had borrowed money from the Duke of Montrose, his estates were seized by the Duke. Rendered desperate by his misfortunes, Rob Roy collected a band of about 20 followers and made open war upon the Duke, sweeping away all the cattle of a district and intercepting the rents of his tenants notwithstanding the vicinity of the garrisons of Stirling, Dumbarton, and Glasgow. His exploits have been immortalized by Sir Walter Scott in his novel *Rob Roy*, written in 1817. In 1722 he submitted to the authorities and was imprisoned in Newgate and in 1727 was sentenced to transportation to Barbados, but was reprieved. He retired to Balquhidder, where he died, Dec. 28, 1734. Consult: Scott's introduction to his novel *Rob Roy;* K. Macleay, *Historical Memoirs of Rob Roy and the Clan Macgregor* (London, 1881); A. H. Miller, *Story of Rob Roy* (ib., 1883).

ROB ROY. The name used by John MacGregor (1825–92) (q.v.).

ROBSART, rŏb'särt, Amy. A character in Scott's *Kenilworth*, secretly married to the Earl of Leicester.

ROBSON, rŏb'son, Eleanor Elise (1879–). An American actress, born at Wigan, Lancashire, England. She first appeared on the stage at San Francisco in 1897, first played in New York in *Arizona* (1900), and then was seen in leading rôles in *A Gentleman of France* (1901), *Audrey* (1902), *Romeo and Juliet* (1903). Her first great success was as Mary Ann in Zangwill's play, *Merely Mary Ann*, which was played in New York, London, and elsewhere in 1903–05. Subsequently she starred in *She Stoops to Conquer* (1905); *The Girl who Has Everything* (1906); *Susan in Search of a Husband* (1906); *Salomy Jane* (1907); and her greatest success, *The Dawn of a To-Morrow* (1908–10). She retired from the stage after her marriage to August Belmont (q.v.) in 1910.

ROBSON, Stuart (1836–1903). An American comedian. He was born at Annapolis, Md., his real name being Robson Stuart. He made his début at the Baltimore Museum in 1852, but, though his part then was serious, his voice and manner unintentionally made it laughable, and he wisely determined to devote himself to comedy, in which he quickly met with success. His Captain Crosstree in the burlesque of *Black-Eyed Susan* is one of his best-remembered characters. In 1877 he made a hit in *Our Boarding House* with W. H. Crane (q.v.), and the two established a partnership which lasted till 1889. They successfully revived several of Shakespeare's comedies, but their most popular production was Bronson Howard's play *The Henrietta* (1888–89). After parting with Crane Robson starred in *The Henrietta, She Stoops to Conquer, The Meddler*, and other pieces. He died April 29, 1903. Consult McKay and Wingate, *Famous American Actors of To-Day* (New York, 1896), and L. C. Strang, *Famous Actors of the Day in America* (Boston, 1900).

ROBURITE, rō'bŭr-īt. See Explosives.

ROBUSTI, rō-bŭs'tē, Jacopo. See Tintoretto.

RO'BY, Henry John (1830–1915). An English legal scholar, born at Tamworth. He was educated at St. John's College, Cambridge, where after his graduation he was tutor and lecturer from 1853 until 1861. Afterward he was master at Dulwich College for four years and in 1866–68 was professor of jurisprudence at University College, London. In 1890–95 he represented Eccles in the House of Commons. His works include: *Remarks on College Reform* (1858); *Grammar of Latin Language* (2 vols.,

1871–74; new ed., 1896); *Introduction to Justinian's Digest* (1884), a valuable work; *Roman Private Law in the Times of Cicero and the Antonines* (2 vols., 1902); "Roman Law," in vol. ii of *Cambridge Medieval History* (1913).

ROC (Ar. *rukhkh*, from Pers. *rukh*). A marvelous bird of Arabic legend. It was so large that it could easily carry off elephants, and Sindbad the Sailor records his coming upon the egg of the bird, measuring 50 paces in circumference. The home of the monster was localized in Madagascar, and this gives a clew to one of the roots of the tradition. That island was the home of a large prehistoric bird (the Æpyornis, q.v.), of which fossil eggs have been discovered measuring 13 inches in length. In the Babylonian mythology the storm god Zu was represented in the form of a bird, the idea arising from the birdlike masses of clouds gathering at the storm. Like traditions of such a cosmical bird are to be found in Indian, East Indian, Persian, and Egyptian mythology. Consult E. W. Lane, *Arabian Nights Tales and Anecdotes* (London, 1845), and Sir Henry Yule, in *Book of Marco Polo* (ib., 1871).

ROCA, rō'kȧ, Julio Argentino (1843–1914). An Argentine soldier and statesman, born in Tucumán and educated in Córdoba. He served in the Paraguayan War (1865–70), rose to the rank of general and achieved popularity in the successful campaign against the Indians in the southern part of the Province of Buenos Aires in 1879. While he was candidate for the presidency in 1880, a revolt of the Province of Buenos Aires occurred; Roca suppressed it and was elected. His task was to reduce chaos to order, strengthen the national administration, and teach the people that they were Argentines. He fostered railway extension and public works and encouraged foreign immigration and the sale of public lands. His approval of the decree suspending specie payments, however, was a mistake and caused the country much difficulty in later years. Roca served as Minister of the Interior under his successor Pelligrini (1890–92). Reëlected to the presidency in 1898, he initiated needed financial legislation, promoted public works, and averted a war with Chile over the boundary question (1902). At the close of his six-year term he was made Minister to Brazil and later held the same position in France.

ROCAMBOLE, rŏk'ȧm-bōl (*Allium scorodoprasum*). A North European plant closely related to, larger than, and resembling garlic in habit, like which it is sometimes cultivated and used.

ROCCELLIN, rŏk-sĕl'ĭn. See Coal-Tar Colors.

ROCH, rŏk, Saint (c.1295–c.1327). A popular saint of the French church, the patron of those sick of the plague, and specially honored by physicians and hospitals. He was born of noble family at Montpellier. He undertook a pilgrimage to Rome at a time when pestilence was raging in Italy and devoted himself to the care of the sick in different places. At Piacenza he was himself smitten and dragged himself to a neighboring forest, where a dog is said to have brought him food daily till his recovery. He returned to Montpellier, where he was thrown into prison as a spy, and died about 1327. His day is August 16. Paul III instituted the confraternity of St. Roch, which still exists. Consult Coffinières, *St. Roch, études historiques sur Montpellier au XIVme siècle* (Montpellier, 1855), and his *Life* by Chavanne (Lyons, 1876).

ROCHAMBEAU, rô'shän'bô', Jean Baptiste Donatien de Vimeur, Count de (1725–1807). A French soldier, born July 1, 1725, at Vendôme, where his father, a general in the French army, was Governor. He was educated for the Church at Blois, but in 1742 became a cornet in the army. He distinguished himself in the War of the Austrian Succession and at its close had attained the rank of colonel. In 1749 he succeeded his father as Governor of Vendôme. He commanded his regiment in the Minorca expedition of 1756, distinguished himself in the capture of Port Mahon, was promoted to the rank of brigadier general, and served with credit in the campaigns of the Seven Years' War in Germany. In 1769 he became inspector general of the French army and in 1780 lieutenant general. In the latter year he was sent at the head of 6000 French regulars to coöperate with Washington against the English in America and landed at Newport on July 10. The French fleet under De Ternay, which had accompanied Rochambeau's army, was soon afterward blockaded in Narragansett Bay, and Rochambeau, unwilling to abandon De Ternay, was kept inactive in Rhode Island for an entire year. Rochambeau's forces left Rhode Island in July, 1781, marched across Connecticut, and joined Washington on the Hudson near Dobbs Ferry. On August 19 the combined forces began their famous southward march to Yorktown, where they joined Lafayette's little army by September 18. On October 19 Cornwallis was forced to surrender. During the entire campaign Rochambeau placed himself wholly under Washington's command and, according to his instructions, acted as though his troops were simply a part of the American army. In recognition of their services Congress voted the thanks of the nation to Rochambeau and his troops. Returning to France early in 1783, Rochambeau was appointed Governor of Picardy and Artois and in 1791 was made a marshal. He was in sympathy with the Revolutionary movement in France at the outset and for a time was commander of the Northern Army, but the excesses of the Revolutionary leaders caused him to retire in disgust in July, 1792. He was imprisoned during the Reign of Terror and only escaped the guillotine by the fall of Robespierre in 1794. Subsequently he was released and was restored by Napoleon to his rank and estates. He died at Thoré, May 10, 1807. On May 24, 1902, a statue of Rochambeau, the gift of France to the United States, was unveiled in Washington by President Roosevelt. He published *Mémoires militaires, historiques et politiques de Rochambeau* (Paris, 1809). A part of the first volume, translated into English by M. W. E. Wright, was published under the title *Memoirs of the Marshal Count de Rochambeau Relative to the War of Independence of the United States* (1838). Rochambeau's correspondence from his arrival at Newport to the close of the Virginia campaign has been printed in Daniel, *Histoire de la participation de la France à l'établissement des Etats Unis d'Amérique*, vol. v (Paris, 1892). A brief anonymous work entitled *Journal des opérations du corps français sous le commandement du comte de Rochambeau*, which has been translated into English and published in several forms, has been attributed to him, and he is supposed to have inspired if not actu-

ally collaborated in the work of Françoise Soulé, *Histoire des troubles de l'Amérique anglaise* (Paris, 1787). Consult: Gachot, "Rochambeau," in the *Nouvelle Revue* (Paris, 1902); H. C. Lodge, *A Fighting Frigate and Other Essays* (New York, 1902); *Rochambeau*, published by the Joint Commission on Library of the United States Congress (Washington, 1907); J. A. A. J. Jusserand, *Rochambeau in America* (ib., 1912).

ROCH'DALE. A manufacturing town in Lancashire, England, 11 miles north-northeast of Manchester (Map: England, D 3). The parish church dates from the twelfth century. There is a free grammar school founded in 1565. The town hall is a fine building. Rochdale is noteworthy in economic history as the scene of the first successful experiment in coöperation. (See ROCHDALE PIONEERS.) Woolen manufactures were introduced by a colony of Flemings in the reign of Edward III; cotton is manufactured, and there are a number of iron foundries and machine works. There is a considerable trade in coal and stone. Rochdale is mentioned in Domesday as *Recedam*. Its first charter was granted by Richard I. John Bright was a native of Rochdale; a bronze statue to his memory is one of the town's monuments. Pop., 1901, 83,100; 1911, 91,428. Consult *Victoria History of the County of Lancaster* (8 vols., London, 1906–14).

ROCHDALE PIONEERS (Rochdale Society of Equitable Pioneers). An organization of flannel weavers of Rochdale, Lancashire, England, founded in 1844, the first to attain distinction in the coöperative movement. There were 28 members, each subscribing for one share of stock, a total of £28, and this not all paid in. The second year there were 74 members and a capital stock of £181. A small store was opened and the necessaries of life sold to members almost at cost. Within 25 years the society had a membership of over 5560 and a stock of £81,232. The small store expanded into numerous shops and manufactories, and a hospital, reading rooms, a large library, and classes in arts and sciences were established. The store was managed in the name and for the advantage of the working-class purchasers. The town savings bank failed soon after the organization of the company, which thereupon practically took the place of the bank. During the early years the promoters served without recompense, but afterward salaried officials were employed. The profits were divided. After paying all expenses and a dividend of 5 per cent on the capital stock, 2.5 per cent of the balance was allotted to the educational fund, and the remainder was distributed among the members in proportion to their purchases. The society has not only been a great success, but it has stimulated the coöperative movement throughout England. Consult: Beatrice Potter, *The Coöperative Movement in Great Britain*, in "Social Science Series" (New York, 1892); Benjamin Jones, *Coöperative Production* (2 vols., Oxford, 1894); G. J. Holyoake, *The History of Cooperation in Rochdale* (new ed., 2 vols., New York, 1906). See COÖPERATION.

ROCHE, rōch, ALEXANDER (1861–1921). A Scottish figure, portrait, and landscape painter. He was born in Glasgow and studied in Paris under Boulanger and Lefebvre and at the Beaux-Arts with Gérôme. His work is characterized by refined and graceful handling, subdued yet pleasing color, and wholesome sentiment. In the treatment of landscape he displays much poetic insight. Good examples of his work, which are to be found in many foreign public collections, include: "Tête à Tête" (gold medal, Munich, 1891); "Landscape" (gold medal, Munich, 1897); "The Window Seat" (Carnegie Institute, Pittsburgh); "Spring"; "Low Tide" (1900); "Prue" (1902, Munich Gallery); "An Old Song" (1902, Stuttgart Public Museum); "Margaret" (Scottish National Gallery, Edinburgh); "The Building of the Ship" (1905, Dublin Gallery of Modern Art); "Old Harbour" (1907). Characteristic portraits are those of Mrs. Andrew Carnegie and daughter (1903) and Miss Flora Stevenson, LL.D. (National Portrait Gallery, Edinburgh, 1905). In 1900 he was elected to the Royal Scottish Academy.

ROCHE, SIR BOYLE (1743–1807). An Irish politician. In early life he entered the army and saw service in America. He sat in the Irish Parliament from 1777 until the Union, uniformly supporting the government, in return for which he was made Baronet and received a pension. He contributed not a little to the bringing about of the Union, but his fame chiefly rests upon his reputation as an inveterate perpetrator of bulls of the true Irish variety.

ROCHE, JAMES JEFFREY (1847–1908). An American poet and journalist. He was born in Montmellick, Queen's County, Ireland. In his infancy his parents emigrated to Prince Edward Island, where he was educated in St. Dunstan's College. In 1866 he went to Boston, Mass., where in 1883 he joined the editorial staff of the *Pilot*, of which in 1890 he became editor in chief. He was appointed United States Consul at Genoa in 1904 and at Bern in 1907. His writings include: *Songs and Satires* (1887); *Ballads of Blue Water* (1895); *The Vase, and Other Bric-a-Brac* (1900); *Life of John Boyle O'Reilly* (1891; new ed., 1908); *The Story of the Filibusters* (1891); *The Sorrows of Sap'ed* (1904); *Her Majesty the King: A Romance of the Harem* (1915).

ROCHE, KARL LA. See LA ROCHE, KARL.

ROCHE, rôsh, TROÏLUS DE MESGOUAT, MARQUIS DE LA. A French explorer and colonizer, born in Brittany, France, about the middle of the sixteenth century. In 1598 he bargained with Henry IV to colonize New France. He was made lieutenant general of Canada, Hochelaga, Newfoundland, and Labrador, and of the adjacent countries "not possessed by any Christian prince." Having gathered an expedition largely composed of convicts from the prisons, in 1598 he set sail with these in a small vessel and explored the country about the mouth of the St. Lawrence. Upon Sable Island he left the convicts, 40 in number, intending to transfer them afterward to the mainland, but his vessel was driven by a tempest back to France, and it was not until 1603 that the 12 survivors were taken off by Chefdhôtel. Consult Samuel Champlain, "Voyages," in *Publications of the Prince Society*, vols. xi–xiii (Boston, 1878–82), and Francis Parkman, "Pioneers of France in the New World," in *France and England in North America*, part i (ib., 1898).

ROCHEBLAVE, rôsh'blåv', SAMUEL (1854–). A French biographer, critic, and teacher, born at Branoux. He became a doctor of letters in 1890 and taught at lycées before joining the staffs of the Lycée de Janson de Sailly and the Ecole des Beaux-Arts. His work in criticism of

nineteenth-century literature and in art appreciation is notable. He wrote: *Essai sur le comte de Caylus* (1889), *Etude sur Joseph de Maistre* (1892), *George Sand et sa fille* (1905), all three crowned by the French Academy; *Les Cochin* (1899), crowned by the Academy of Fine Arts; *Louis-Auguste Himly* (1907); *Agrippa d'Aubigné* (1910), in "Great Writers of France Series"; *Jean-Jacques Henner* (1911); *Riche et pauvre, lecture courante* (1912). Rocheblave also contributed articles on George Sand to the *Revue de Paris* and wrote numerous art critiques for such reviews as the *Revue de l'Art Ancien et Moderne.*

ROCHECHOUART DE MORTEMART, Françoise Athénaïs de. See Montespan.

ROCHEFORT, rôsh'fôr'. A fortified seaport and naval arsenal in the Department of Charente-Inférieure, France, on the right bank of the Charente, 9 miles from the sea and 18 miles southeast of La Rochelle (Map: France, S., D 3). It is surrounded by ramparts and protected by forts at the mouth of the river and is a clean, well-built town. The harbor is one of the three largest in France. Rochefort has fine wharves, extensive magazines, dockyards, cannon foundries, and large bread and biscuit stores. The most celebrated of its many institutions are the marine hospital, founded in 1787, and the general civil college. Shipbuilding is the most important industry, and some furniture is manufactured. Rochefort's rise from a fishing village dates from 1666, when Louis XIV chose it for a naval station and Vauban planned its fortifications. While waiting at the neighboring Ile d'Aix for a chance to escape from Rochefort to America, Napoleon surrendered to the British. Pop., 1911, 35,019.

ROCHEFORT, (Victor) Henri, Marquis de Rochefort-Luçay (1830–1913). A French journalist and politician, born in Paris, Jan. 30, 1830. He was educated at the College of Saint-Louis, and shortly after his graduation he found employment in a government office. In 1863 Rochefort became one of the editors of the *Figaro* and in 1866 began a series of mordant attacks on the Napoleonic government which aroused the hostility of the authorities until the publisher dropped Rochefort from the editorial staff. The repeal of the most arbitrary restrictions on the press in 1868 enabled Rochefort to start *La Lanterne,* a weekly which soon obtained an immense circulation. Convicted of disrespect towards the government and sentenced to a year in prison, a fine of 10,000 francs, and deprivation of civil and political rights, Rochefort escaped to Brussels, where he continued the publication of *La Lanterne.* In 1869 he was elected to the Legislative Assembly. He showed himself as hostile as ever to the government, published *La Marseillaise,* and was again sent to prison, but on the downfall of the Empire he regained his liberty and was for a short time member of the Government of National Defense. After the capitulation of Paris (January, 1871) he founded *Le Mot d'Ordre,* which defended Gambetta's policy. He believed that Thiers was unfriendly to a republic and threw in his lot with the Commune. Rochefort was arrested, tried, and in 1873 sent to the penal colony of New Caledonia. He escaped in 1874, returned, and revived *La Lanterne* in Geneva. The general amnesty of July, 1880, permitted his return to Paris, where he established a journal named *L'Intransigeant.* He was elected to the Chamber of Deputies in 1885, but resigned the following year. In 1888 Rochefort played a prominent part in the political agitation caused by the movement in favor of General Boulanger, whom he earnestly supported, and with whom, in 1889, he suffered exile. He returned to Paris after the amnesty of 1895 and continued his career of journalist. Rochefort died July 1, 1913. He published: *Les français de la décadence* (1866); *La grande Bohême* (1867); *Les petites mystères de l'Hôtel des Ventes* (1862); *Les naufrageurs* (1876); *L'Evadé* (1880); *Les dépravés* (1882); *Napoléon dernier* (1884); *Les aventures de ma vie* (Paris, 1896). Consult J. F. Macdonald, "Personal Recollections of Rochefort," in *Contemporary Review,* vol. civ (London, 1913).

ROCHEFOUCAULD, rôsh'fōō'kō'. See La Rochefoucauld.

ROCHEFOUCAULD-LIANCOURT, lē'äN'-kōōr'. See La Rochefoucauld-Liancourt.

ROCHEGROSSE, rôsh'grôs', Georges (1859–). A French historical and decorative painter. He was born at Versailles and studied in Paris with Jules Lefebvre and Boulanger. His themes are generally historical, and he treats them on a colossal scale and in an emotional naturalistic style, with a distinct reveling in the horrible. "Vitellius" (1882), "Andromache" (1883), "La Jacquerie" (1885), "The Fall of Babylon" (1891), "The Death of the Emperor Geta" (1899, Amiens Museum), and "Barbarian Ambassadors at the Court of Justinian" (1907), are examples of his strong and spirited but sensational and often brutal painting. In quite another style and beautiful in color is his "Knight among the Flowers" (1894, Luxembourg), and his decorative ability is well displayed in his mural paintings for the Sorbonne. His illustrations for Flaubert's *Salammbô* and *Herodias* are widely known. He was elected an Officer of the Legion of Honor in 1892 and received the medal of honor in 1906 for "The Red Delight."

ROCHELLE, rō-shĕl'. A city in Ogle Co., Ill., 75 miles west of Chicago, on the Chicago and Northwestern, the Chicago, Burlington, and Quincy, and the Chicago, Milwaukee, and St. Paul railroads (Map: Illinois, F 2). Noteworthy features are the Carnegie library and the Lincoln Hospital. The chief industrial establishments are canning factories, an oatmeal mill, and machine works. Rochelle has the commission form of government. Pop., 1900, 2073; 1910, 2732.

ROCHELLE, rō'shĕl', La. The capital of the Department of Charente-Inférieure, France, and a seaport, situated on a bay on the west coast, 290 miles by rail from Paris and 120 miles from Bordeaux (Map: France, S., C 2). Its harbor is one of the best on the coast. The most interesting building of the town is the town hall, dating from 1486 to 1607. The cathedral is a Grecian structure of the eighteenth century. Other interesting buildings are the exchange, the palais de justice, and the so-called House of Henry II. The old episcopal palace now contains a library of over 52,000 volumes and about 1000 manuscripts, and a picture gallery with paintings by Corot, Rousseau, and other modern French artists. There are a lycée, a theological seminary, a training school for teachers, an academy of art, an archæological museum, and a botanical garden. The chief products are sardines, porcelain and glass wares, textiles, sugar, etc. Pop., 1901, 31,559; 1911, 36,371.

La Rochelle is first mentioned as *Rupella* in 981. It was fortified and endowed with some privileges by William IX of Aquitaine, and its franchises were further increased with its passing under the rule of England, as a part of the dowry of Eleanor, wife of Henry Plantagenet. In 1224 Louis VIII of France obtained possession of it. As a stronghold of Calvinism it became a target for attacks both by land and by sea and withstood a siege of six and one-half months by the Catholic army in 1573, which terminated in a treaty by which the Huguenots were granted liberty of worship. La Rochelle was invested by a strong army on Aug. 15, 1627, and, after a siege of over 14 months during which two English fleets were repulsed by the besieging army and the population dwindled from 18,000 to 5000, the town capitulated on Oct. 28, 1628. Consult Amos Barbot, *Histoire de La Rochelle* (3 vols., Paris, 1886–90); Louis Meschinet de Richemond, *Les Rochelais à travers les siècles* (ib., 1910).

ROCHELLE POWDERS. See SEIDLITZ POWDERS.

ROCHELLE SALT. The popular name of the double tartrate of sodium and potassium, having the formula $KNaC_4H_4O_6 + 4H_2O$. It was discovered in 1672 by a La Rochelle apothecary named Seignette. It occurs, when pure, in colorless transparent prisms, generally eight-sided, and in taste it resembles common salt.

ROCHEMONT, EMILE THÉODORE. See QUINETTE DE ROCHEMONT, E. T., BARON.

ROCHEREAU, PIERRE MARIE PHILIPPE ARISTIDE. See DENFERT-ROCHEREAU, P. M. P. A.

ROCH'ESTER. A city and river port in Kent, England, on the right bank of the Medway, 26 miles east-southeast of London (Map: England, G 5). Together with Chatham (q.v.) and Strood, it forms one large town. The celebrated cathedral is 306 feet long. The nave and crypt are Norman and the choir and transepts early English. The tower and spire were completed in 1904. The ruined castle, crowning an eminence, has a solid and massive Norman keep, restored in 1900. In 1883 it was purchased by the city, and its grounds were turned into a public garden overlooking the Medway. There are manufactures of oil and oil cake, of agricultural implements, and traction engines. Rochester is the ancient Durobrivæ. The bishopric of Rochester was founded in 604. Pop., 1901, 30,600; 1911, 31,384.

ROCHESTER. A city and the county seat of Fulton Co., Ind., 98 miles north of Indianapolis, on Lake Manitou and on the Erie and the Lake Erie and Western railroads (Map: Indiana, E 2). It has a Carnegie library, and fine high-school and county buildings. Important as the trade centre of a vast farming region, it has also a variety of industrial establishments producing bridges, machinery, canned goods, pickles, gloves, etc. It was chartered as a town in 1832. Pop., 1900, 3421; 1910, 3364.

ROCHESTER. A city and the county seat of Olmsted Co., Minn., 107 miles southeast of St. Paul, on the Chicago Great Western and the Chicago and Northwestern railroads (Map: Minnesota, E 7). It contains the State Hospital for the Insane, St. Mary's Hospital, and imposing public-library and Federal buildings. The city has become famous as the home of Charles and William Mayo (qq.v.), the noted surgeons who have organized the Mayo clinic of St. Mary's. There are manufactories of flour and cameras. Rochester was incorporated in 1858. Pop., 1900, 6843; 1910, 7844; 1920, 13,722.

ROCHESTER. A city in Strafford Co., N. H., 20 miles northwest of Portsmouth, on the Cocheco River and on the Boston and Maine Railroad, at the junction of three divisions (Map: New Hampshire, J 7). It has a public library. The annual fair held here is very largely attended. Shoes, woolen goods, brick, leatherboard, and lumber products are the important manufactures. Excellent water power is derived from the Cocheco and the Salmon Falls River, near by. Pop., 1900, 8466; 1910, 8868; 1915 (U. S. est.), 9078. Rochester was incorporated as a town by royal charter in 1722, but was not settled until six years later. In 1891 it was chartered as a city. Consult McDuffee, *History of the Town of Rochester* (Manchester, N. H., 1892).

ROCHESTER. The county seat of Monroe Co., N. Y., and the third largest city of the State, 69 miles east by north of Buffalo (Map: New York, C 4). It is situated 7 miles from Lake Ontario and is nearly bisected by the Genesee River, which in the northern part of the city flows through a deep precipitous gorge. The river makes a descent of 257 feet within the limits of the city in three falls and several rapids. The upper falls, 95 feet high, are near the centre of the city. Twelve bridges span the river, one of which is 212 feet high and 990 feet long. The Erie Canal crosses the river by an aqueduct 848 feet long and 45 feet wide, completed in 1838. The city is connected with the Barge Canal, which passes to the south, by a branch about 5 miles long. The railroads that enter Rochester are the New York Central and Hudson River, the West Shore, the Erie, the Lehigh Valley, the Pennsylvania, and the Buffalo, Rochester, and Pittsburgh.

The site of the city is level and elevated, its altitude being about 500 feet above the sea and 263 feet above Lake Ontario. Its total area is 26 square miles. Rochester is well laid out. The streets are broad and regular and in the residential district are very beautiful. The total mileage of streets is about 361, of which 312 miles are improved, asphalt, granite, and Belgian blocks and macadam being mostly used. There are 20 parks, of which the largest is Durand-Eastman Park (502 acres), situated on the shore of the lake. Genesee Valley Park (340 acres), south of the city, lies mainly on the eastern bank of the Genesee. Seneca and Maplewood, to the north, are also on the river. The former is noted for its picturesque scenery and its zoölogical garden. Highland Park has an extensive collection of low-growing trees and shrubs. Washington Square contains the Soldiers' and Sailors' Monument. The area of the park system in 1915 was 1610 acres. There are three large cemeteries, Mount Hope, Holy Sepulchre, and Riverside. Frederick Douglass (q.v.), whose home was in Rochester, is buried in Mount Hope Cemetery, and a statue to his memory was erected in 1898 in one of the city squares. There are 127 miles of track (1915) in the street railway system within the city limits. The city is also connected with Buffalo, Syracuse, and Geneva, and with intermediate and nearby villages by five interurban electric lines comprising more than 250 miles of track.

The courthouse, of granite, is prominent among the public buildings. Other structures of note are the city hall, the post office, the State

Armory, the Y. M. C. A., the Masonic Temple, the East and West high schools, the Genesee Valley Club, the Rochester Trust and Safe Deposit Building, the following office buildings—Powers, Granite, Chamber of Commerce, Wilder, and Mercantile, and the office building of the Buffalo, Rochester, and Pittsburgh Railroad; the Powers, Seneca, Rochester, and Whitcomb hotels; the department stores of Sibley, Lindsay, Curr & Company and of the Duffy-Powers Company; and several large theatres. Charitable and other institutions of similar nature include the Western New York Institution for Deaf Mutes; the Rochester State Hospital for the Insane; the General, Homœopathic, Hahnemann, and St. Mary's hospitals; a municipal hospital for contagious diseases, Iola Sanitarium for tubercular patients, and a large dental clinic; Monroe County almshouse; homes for the aged; orphan asylums, notably the Rochester Orphan Asylum; the Children's Aid and Humane societies. There is also a United Charities organization. Among penal institutions is the county penitentiary. Rochester is the seat of the University of Rochester (see ROCHESTER, UNIVERSITY OF), the Rochester Theological Seminary (Baptist, opened in 1851), St. Bernard's Seminary (Roman Catholic, opened in 1893), and Mechanics Institute (q.v.). Its students number about 5000. The Reynolds Library with 78,000 volumes, the Rochester Public Library with 65,500 in four large branches, and the Law Library with 21,000 are the largest collections of books in the city, aside from those belonging to the educational institutions.

Primarily a manufacturing city, Rochester is also the distributing centre for a highly productive agricultural section and carries on considerable lake commerce through its port, Charlotte, on Lake Ontario, at the mouth of the Genesee. The customs receipts for 1914 were $321,914.79. The amount of coal exported annually is over 600,000 tons. Charlotte is also a port for passenger steamers to Toronto, Coburg, and the Thousand Islands.

Once noted for its extensive flour-milling interests, Rochester now is best known for its production of photographic apparatus, optical instruments, boots and women's and children's shoes (total output, 1914, $25,000,000), and men's clothing (total output, 1914, $22,000,000). It greatly surpasses all other cities in the manufacture of photographic apparatus and in addition is one of the leading cities of the world in the production of nursery stock, thermometers, filing-devices and office systems, lubricating oil, and canned fruits and vegetables. It leads all other cities of the United States in the manufacture of ivory buttons, carbon paper, and typewriter ribbon. Other leading articles produced are wood-working and machine-shop products, electrical machinery, telephones and telephone appliances, railway signaling devices, flour, malt liquors, stoves, carriages, and furniture. In 1915 the total number of manufacturing establishments in Rochester was over 1400; the total capital invested in manufacturing industries was $95,708,000; total employees, 75,000; and total annual salaries and wages, $29,252,000.

Rochester is a city of the first class. The present city charter became operative on Jan. 1, 1908. The government is vested in a mayor and common council, elected every two years, and in various administrative departments. The comptroller, treasurer, police justice, assessors, supervisors, aldermen, and school commissioners are chosen by popular election; other officials are appointed by the mayor. The city clerk is elected by the common council. The city appropriates annually for maintenance and operation about $5,624,070, the principal items for 1915 being: schools, $1,541,403.91; lighting, $340,000; fire department, $544,627.50; police department, $513,732.50; streets and sewers, $484,202.50; garbage removal, $90,500; water works, $675,000; charitable institutions, $154,628. The assessed valuation in 1914 was $226,223,540. The water works, which have cost $11,580,081.57, are owned and operated by the municipality. There are in all 418 miles of mains. Two systems are in operation—a gravity system for drinking water, deriving its supply from lakes some 30 miles south of the city, and a direct pumping system taking water from the Genesee River. The direct system is used for manufacturing purposes, for the fire department, etc. These works have a daily distribution of 22,000,000 gallons. In connection with the gravity system are a storage reservoir and a distributing reservoir, possessing capacities respectively of 140,000,000 and 22,500,000 gallons.

Pop., 1820, 2063; 1850, 36,403; 1870, 62,386; 1880, 89,366; 1890, 133,896; 1900, 162,608; 1910, 218,149; 1915, 248,465; 1920, 295,750.

Rochester was permanently settled in 1812 on land owned by Nathaniel Rochester (q.v.), William Fitzhugh, and Charles Carroll, all of Maryland. The first frame dwelling house was built in that year. Until 1822 the village (incorporated in 1817) was known as Rochesterville, and in 1834 the city of Rochester was chartered. The opening of the Erie Canal in 1825 gave a great impetus to the growth of the place. Rochester was the centre of the Antimasonic excitement from 1826 to 1835, William Morgan having been a resident of the city before his abduction from Canandaigua. (See ANTIMASONS.) In 1849 the famous "Rochester Rappings" attracted widespread attention and gave rise to the cult of Spiritualism (q.v.) in the United States. Before the Civil War Rochester, as the home of Myron Holley and Frederick Douglass (qq.v.), was prominent in the antislavery agitation, and it was here that Seward in 1858 made the famous speech in which he spoke of the impending "irrepressible conflict between opposing and enduring forces." Consult: *First Directory of the Village* (Rochester, 1827); *O'Reilly, Sketches of Rochester and Western New York* (ib., 1838); W. F. Peck, *Semi-Centennial History* (Syracuse, 1884); id., *History of Rochester and Monroe County* (Chicago, 1908); C. E. Fitch, "Sketches of the City of Rochester," in J. N. Larned, *History of Buffalo* (2 vols., Buffalo, 1911).

ROCHESTER. A borough in Beaver Co., Pa., 25 miles northwest of Pittsburgh, on the Ohio River, at its junction with the Beaver, and on railroads of the Pennsylvania system (Map: Pennsylvania, A 5). It has valuable advantages as an industrial centre, being situated in a district producing gas, oil, coal, fire clay and building stone. The manufactures include glass (tumblers, cut glass, bottles), structural steel, pottery, brick, stoves, flour, and lumber products. Pop., 1900, 4688; 1910, 5903.

ROCHESTER, HENRY WILMOT, EARL OF (c.1612–58). An adherent of Charles I and Charles II. For his part in the plot against the Long Parliament he was expelled from the Com-

mons. In the Civil War he sided with the King, and defeated Waller at Roundway Down in 1643 and again in 1644 at Cropredy Bridge, but because of his intrigues and the hostility of Prince Rupert and of Lord Digby was deprived of his command. He retired to France and became an intimate friend of Charles II. He was made Earl of Rochester in 1652, was very successful in diplomatic errands to the Continent, and took part in most of the Royalist plots against Cromwell.

ROCHESTER, JOHN WILMOT, second EARL OF (1647–80). An English poet, wit, and courtier. He was born at Ditchley, Oxfordshire. He entered Wadham College, Oxford, when only 12 years old and at 14 was, with other persons of rank, made M.A. by Lord Clarendon. After traveling in France and Italy he became attached to the court and rose high in favor with Charles II, who made him one of the gentlemen of the bedchamber and comptroller of Woodstock Park. His wit and love of pleasure made him a favorite of a dissolute court; he, however, incurred the displeasure of the King and was committed to the Tower for the forcible abduction of a beautiful heiress, Miss Mallett, whom he subsequently married before he was 20 years old. He wrote prose and verse with facility, and Anthony Wood speaks of him as the greatest scholar among the nobility of his day; but as he grew older he gave less time to study. His health became undermined by excess, and he died at the age of 32. Bishop Burnet wrote an interesting account of his death under the title of *Some Passages in the Life and Death of John Wilmot, Earl of Rochester* (1680). His published works include many love songs, an elegant *Imitation of Horace on Lucilius*, a *Satire against Man*, in which he is much indebted to Boileau, and an *Essay on Nothing*. Consult Thomas Longueville, *Rochester and Other Literary Rakes of the Court of Charles II* (New York, 1903).

ROCHESTER, LAURENCE HYDE, EARL OF (1641–1711). An English statesman, son of the historian Clarendon. He entered Parliament at the Restoration, acted on several diplomatic missions, and in 1679 became First Lord of the Treasury and Privy Councilor. In 1681 he was made Viscount Hyde by Charles II. In the same year he negotiated a secret subsidy from France and in November became Earl of Rochester. On the accession of James II he became Lord Treasurer. On account of his opposition to the King's Catholic policy, and for his stand as an English churchman, he was dismissed in 1687 with a large pension. In 1689 Rochester was in ill favor with Mary owing to his support of the suggestion of a regency, but regained her favor by his later diplomacy, was readmitted to the Privy Council in 1692, and in 1700 became Lord Lieutenant of Ireland and practically Premier. After William's death Anne's trust in him was undermined by the Marlboroughs, and he returned to power again only in 1710. Rochester edited his father's *History of the Great Rebellion* (1702–04).

ROCHESTER, NATHANIEL (1752–1831). An American soldier and manufacturer, born in Westmoreland Co., Va., whence he early removed to Granville Co., N. C. Rochester was a member of the Committee of Safety in 1775 and of the North Carolina Provincial Congresses in 1775 and 1776. During the Revolutionary War he superintended the manufacture of arms at Hillsboro and at its close removed first to Philadelphia and afterward to Hagerstown, Md. In 1802 with Charles Carroll and William Fitzhugh he bought the Hundred Acre Tract, now in the centre of the city of Rochester, N. Y. In 1810 he went up the Genesee valley to Dansville, where he established a paper mill, and later he removed to Bloomfield. In 1817 he was secretary of a convention at Canandaigua to urge the completion of the Erie Canal. In 1818 he removed to the village of Rochesterville (the future Rochester), which had been named in his honor. He succeeded (1821) in securing the passage of the bill creating the new county of Monroe, and in 1822 was a member of the New York Assembly. Consult Nathaniel Rochester, *Early History of the Rochester Family in America* (Buffalo, 1882).

ROCHESTER, UNIVERSITY OF. A nonsectarian college of Liberal Arts at Rochester, N. Y., established in 1850 under Baptist auspices. The university maintains a college for men and a coördinate college for women. College work is arranged in two courses, arts and science, leading to the degrees of bachelor of arts and bachelor of science. In the science course there are three groups—general science, mechanical engineering, and chemistry and engineering. In 1915–16 the students numbered 531 (310 men and 221 women) and the faculty 45. The campus and 12 buildings with equipment, including a library of 66,000 volumes, were valued at $1,500,000, the endowment was $1,650,000, and the income from all sources $144,000. The president in 1915 was Rush Rhees, D.D., LL.D.

ROCHESTER, VISCOUNT. See CARR, ROBERT.

ROCHESTER ATHENÆUM AND MECHANICS INSTITUTE. See MECHANICS INSTITUTE.

ROCHESTER THEOLOGICAL SEMINARY. A Baptist Theological Seminary founded in Rochester, N. Y., in 1850. Its courses of instruction, which are partially elective, are divided among nine departments. The seminary is the largest under the control of the Northern Baptists. Eighty-nine students were enrolled in 1915–16, and the faculty numbered 10. The endowment of the seminary amounts to about $1,800,000, and the total value of the property, including endowment, to $2,200,000, the total income being about $75,000. The library contains 42,900 volumes. The president in 1916 was Clarence A. Barbour, D.D.

ROCHE-SUR-YON, rôsh'sụr'yôn', LA. The capital of the Department of Vendée, France, picturesquely situated on a hill on the right bank of the Yon, 38 miles south of Nantes (Map: France, N., D 6). It was a village of 800 inhabitants in 1804 when Napoleon I selected it for the capital of the department and named it Napoléon-Vendée. Its feudal castle was dismantled by order of Louis XIII. Its ruins formed a quarry for the building of the modern town for which Napoleon I decreed an appropriation of 3,000,000 francs. There are an equestrian statue to Napoleon I and a museum containing some good paintings. Pop., 1901, 13,629; 1911, 14,885.

ROCHET, rŏch'ĕt. See COSTUME, ECCLESIASTICAL.

ROCHOW, rŏk'ō, FRIEDRICH EBERHARD VON (1734–1805). A German philanthropist and educational reformer, born in Berlin. His military career having been cut short in the earliest campaigns of the Seven Years' War by wounds in each hand, he retired to his estate, devoted himself to popular education, and in 1773 built a school

at Rekahn, one of his landed possessions. This was followed by the establishment of several others on his estate. In carrying out his projects he was greatly assisted by H. J. Bruns. Rochow favored state schools and compulsory attendance. His method, especially adapted for country schools, founded on a fairly correct idea of the growth of the mental faculties and urging that only the actually useful should be taught, was set forth in 1772 under the title *Versuch eines Schulbuches für Kinder der Landleute*, and the system was put into practice in his juvenile writings, of which *Der Bauernfreund* (1776) is best known. Rochow's correspondence was published by Jonas (Berlin, 1884) and selections from his works by Gansen (Paderborn, 1894). Consult Pohlisch, *Die pädagogischen Verdienste des Domherrn von Rochow* (Zwickau, 1894), and M. Reiniger, *Friedrich Eberhard von Rochow, der Reformator des preussischen Landschulwesens* (Langensalza, 1905).

ROCK (AS. *rocc*, OF. *roc, roche*, Fr. *roche*, from ML. *roca, rocca*, rock; probably from Ir., Gael. *roc*, Bret. *roch*, rock). A portion of the solid earth. Rocks are composed of mineral matter, although some have an organic origin. In contrast with minerals they are more complex, being aggregates of minerals, usually, though not always, containing a number of different mineral species. This number may be 10 or more, though in rare cases rocks represent a single mineral, and there are seldom more than two or three component minerals which are present in large quantity.

Rocks Classified Genetically. As respects their origin, rocks fall into three grand divisions, viz.: (1) sedimentary, clastic, or aqueous rocks; (2) massive or igneous rocks; (3) metamorphic rocks. Of these divisions the first includes the more diverse types, and no single name has been found sufficiently comprehensive to include them all. The most abundant and widely distributed class within this division is that of the true sedimentary or clastic rocks, which are made up of sediment or detritus deposited in water. If laid down upon the ocean bottom, rocks of this class are described as marine, examples of which are mudstones or shales (q.v.) and some limestones (q.v.); if deposited along shore, littoral, of which conglomerate (q.v.) and sandstone (q.v.) are examples; and if deposited in lakes, lacustrine, or if in streams, fluviatile, as, e.g., silt. Water in the form of ice has likewise been largely instrumental in transporting and depositing rock materials such as gravel, sand, and clay. Again, water confined within the outer zone of the earth's crust through solution and subsequent deposition in crevices and other openings has produced the rocks known as veins (q.v.) or veinstones, which, though comparatively small in bulk, are yet of great importance as the repository of the valuable metals. These are the aqueous rocks in the restricted sense. In arid regions the wind has been an important agent in transporting rock material and producing deposits which are designated æolian accumulations (q.v.). Such a deposit is that of the loess (q.v.) of China.

Massive or igneous rocks are the product of consolidation from cooling of a molten mass or magma. The consolidation may have occurred below the earth's surface either in subterranean reservoirs—batholites (q.v.), laccolites (q.v.), or bosses—producing rock masses more or less equally developed as respects their several dimensions; or the consolidation may have occurred within a fissure forming a comparatively thin rock wall bounded by plane surfaces—dike (q.v.). In either of the above cases the rock formed is said to be of intrusive origin. If the molten mass reached the surface of the earth before consolidation and was poured out either as a broad layer (sheet) or as a stream, the rock produced is described as of extrusive, effusive, or volcanic origin. See IGNEOUS ROCKS.

The division of metamorphic rocks is composed of types developed from processes of alteration out of originally igneous or sedimentary rocks, but it includes not only those rocks which may be traced to the one class or the other, but also those the origin of which is in doubt. Together the several types of this division are described under the name "crystalline schists," of which gneiss (q.v.), schist (q.v.), and phyllite are the most abundant members. See METAMORPHIC ROCKS.

Unaltered sedimentary rocks are further subdivided into those of mechanical, chemical, and organic origin. Of the first-mentioned class are the greater number—the true sediments and the æolian deposits. Sand and gravel, green sand, loess (q.v.), clay, breccia (q.v.), conglomerate (q.v.), graywacke (q.v.), and shale (q.v.) have this derivation. Of chemical origin are the siliceous sinters such as are to-day forming about the geysers in the Yellowstone National Park; the calcareous sinters of caverns in limestone, including stalactites, travertine (q.v.), veinstones, deposits of gypsum (q.v.), and limonite (q.v.); and the many rocks of concretionary structure known as oölite (q.v.). Of organic origin are chalk (q.v.), flint (q.v.), shell limestone, and chert (q.v.). Marl (q.v.), cement rock, lithographic stone (q.v.), and the several varieties of peat (q.v.) and coal (q.v.) have also an organic origin. The larger masses of compact limestone (q.v.) and magnesian limestone or dolomite (q.v.) are known to have an organic and generally also a marine origin, but the exact manner of their formation is a problem regarding which there are many opinions. It is certain that a deposit of compact limestone is forming directly from water in the Everglades of Florida, and it is inferred that this process is a more or less widely distributed one. Limestones may, however, form from the evaporation of an inclosed sea, as has happened in past geological ages within the area of the western United States.

Mechanical Sediments Classified on Basis of Composition. The great class of mechanical sedimentary rocks are classified on the basis of their dominant constituent as arenaceous or siliceous rocks, argillaceous rocks, and calcareous rocks. The first-mentioned rocks contain much quartz or silica; those of the second class abound in clayey material, the base of which is a silicate of alumina and hydrogen (kaolin or china clay) (q.v.), while the class of the calcareous rocks are essentially composed of carbonate of calcium or of calcium and magnesium in the form of the minerals calcite, aragonite, or dolomite. Arkose, graywacke, sandstone, conglomerate, sand, and gravel are the more abundant siliceous sedimentary rocks. Representatives of the argillaceous rocks are argillite or mudstone, shale, clay, mud, and silt. Marl and calcareous shale are calcareous-argillaceous sediments and form a transitional member connecting the argillaceous with the calcareous sedimentary rocks.

Under the calcareous sediments are included limestone and dolomite, chert, etc. See ARENACEOUS ROCKS; ARGILLACEOUS ROCKS; CALCAREOUS ROCKS.

Bibliography. J. F. Kemp, *Hand-book of Rocks for Use without the Microscope* (New York, 1896); J. S. Diller, "The Educational Series of Rock Specimens," in *Bulletin No. 150, United States Geological Survey* (Washington, 1898); L. V. Pirsson, *Rocks and Rock Minerals* (New York, 1908); Alfred Harker, *Petrology for Students* (4th ed., ib., 1908); J. P. Iddings, *Rock Minerals* (ib., 1911); G. A. J. Cole, *Rocks and their Origins*, in "Cambridge Manuals of Science and Literature" (ib., 1912); G. I. Finlay, *Introduction to the Study of Igneous Rocks* (ib., 1913); R. A. Daly, *Igneous Rocks and their Origin* (ib., 1914).

ROCK BADGER, or ROCK RABBIT. See HYRAX.

ROCK BASS. An excellent bass (*Ambloplites rupestris*) of the northern United States and Mississippi valley, called also redeye and goggle-eye. It is a foot long, olive green, with a brassy tinge and much dark mottling, and a black spot on each scale, forming interrupted stripes, the young irregularly barred and blotched. These bass are found in clear streams and lakes, where they keep about rocks or sunken logs. See Plate of BASS.

ROCK BUTTER. A name given to a variety of the mineral halotrichite. It is a yellowish butter-like substance that is found as an efflorescence or exudation from some alum slates, notably those at Hurlet and Campsie, near Glasgow, Scotland, and at Rossville, Richmond Co., N. Y. It is also called mountain butter. The name has likewise been applied to certain varieties of the mineral chrismatite.

ROCK COCK. A South American bird, more usually called cock of the rock (q.v.). It is a type of the genus *Rupicola*, but was formerly included among the related pipras.

ROCK CRAB. An indefinite general name for a variety of crabs customarily living on rocky bottoms, as, along the New England coast, the Jonah crab. The name belongs rather to the family Cancridæ, in which belong more common edible crabs than to any other group.

ROCK CRYSTAL. A colorless, transparent variety of crystallized quartz. The name is applied chiefly to the massive varieties, such as Brazilian pebble, but it also includes the small distinct crystals which are sold as imitations of the diamond and are called variously Bristol diamonds, Lake George diamonds, etc. The name is likewise sometimes extended to the violet variety of quartz or amethyst, to the red variety or Bohemian ruby or Silesian ruby, to the yellow variety or citrine or false topaz, and to the brown variety or smoky quartz. Specimens are sometimes found containing inclusions of hairlike or needle-like crystals of other minerals such as actinolite, asbestos, epidote, göthite, hornblende, rutile, tourmaline, etc., which are called variously by the names of Cupid's arrows, Cupid's nets, Thetis's hair stone, Venus's hair stone, etc.

ROCK DOVE. A wild dove of western Europe (*Columba livia*). See PIGEON.

ROCK'EFELLER, JOHN DAVISON (1839–). An American capitalist, born July 8, 1839, at Richford, Tioga Co., N. Y. When 12 years old he was taken by his parents to Cleveland, Ohio, where he was educated in the public schools, and at 16 became a clerk in a commission house. At 19 he himself embarked in the commission business with a partner named Clark. Both members of the firm were resourceful and clever, and their success was immediate. In 1862 they became associated with Samuel Andrews, an expert oil refiner, and, under the firm name of Andrews, Clark & Co., engaged extensively in the oil business. William Rockefeller (q.v.), a brother, was admitted to partnership, and a new company, William Rockefeller & Co., was formed, which in 1865 built at Cleveland a large refinery, known as the Standard Oil Refinery. The next extension was the formation of an eastern branch at New York, with Henry M. Flagler as an additional partner. In 1870 the several firms were combined under the name of the Standard Oil Company, with a capital of $1,000,000. Of this corporation John D. Rockefeller was the president and controlling spirit. From then on all his energies were bent towards obtaining control of the oil business of the entire country. To accomplish this it was necessary to obtain control not only of the output of the oil fields, but of the means of transportation, and Rockefeller devised a systematic scheme of making arrangements with the railroads whereby the Standard Oil Company, by a system of rebates, should be given preferential shipping rates that would in time render competition next to impossible. With this end in view a coöperative concern known as the South Improvement Company was organized, but so great was the opposition that it was soon dissolved, and less open methods to the same end were adopted. Gradually the Standard Oil Company absorbed or drove out of business most of its principal rivals, and its influence or alliance with the railroads became closer. In 1882 John D. Rockefeller organized the Standard Oil Trust, but after a 10 years' existence it was dissolved. Since then the various companies have been operated separately, but all were under the management of Rockefeller, whose control of oil remained undisputed until his retirement from active business in 1911.

Without a near rival the wealthiest man in the world, Mr. Rockefeller devoted much time and money to various educational, religious, and charitable interests. In 1892 he founded the (second) University of Chicago (q.v.), an institution to which he gave more than $23,000,000. To the General Education Board (q.v.) he gave $50,000,000, and the Rockefeller Foundation (q.v.) received $100,000,000 in 1913. The Rockefeller Institute for Medical Research (q.v.) was built and endowed at a cost of more than $4,000,000. His other donations of $1,000,000 or over were made to Barnard College, Harvard and Yale universities, and the Southern Education Board, but many lesser gifts to colleges, churches, and missions by 1915 had brought the total amount (in gifts of this kind) up to $85,000,000. At this date the total of all his benefactions was about $250,000,000.

ROCKEFELLER, JOHN DAVISON, JR. (1874–). An American capitalist and social investigator, son of John D. Rockefeller. He was born in Cleveland, Ohio, and graduated from Brown University in 1897. In 1901 he married the daughter of Senator Nelson W. Aldrich of Rhode Island. He became connected early with many of the great corporations which his father had founded or partly owned. He was interested in railroads, including the Lackawanna, and became a director of the Colorado Fuel and Iron Com-

pany, the American Linseed Company, and the Merchants Fire Assurance Corporation. For some years he conducted, after organizing, a large Bible class for men at the Fifth Avenue Baptist Church, New York. As foreman of a special grand jury to investigate the white-slave traffic in Greater New York (1910), he conducted the work with energy and in his report made public a startling condition. He went further and organized the Bureau of Social Hygiene, which published many pamphlets and sent experts to Europe to study sociological questions. In 1913–15 he was much before the public in connection with the Colorado miners' strike. He was regarded as the controlling power within the Colorado Fuel and Iron Company, possibly the largest interest involved. Beginning in 1913, this strike (to compel the company to recognize the miners' union) developed into what was virtually civil war between the miners and the mine guards and State militia. Men, women, and children were killed. Besought for assistance, President Wilson in turn appealed to Rockefeller for action that would make unnecessary Federal interference. A committee of the House of Representatives summoned him to explain his position, and the Federal Industrial Relations Commission cross-examined him with severity. To all he answered that he had confidence in the men in charge and that he believed the interest of employees as well as employers demanded the open shop. After being drawn into a bitter controversy with Chairman Walsh of the Industrial Commission he visited Colorado in 1915 to investigate conditions. Consult the *Report* of the Federal Industrial Relations Commission (1915).

ROCKEFELLER, William (1841–1922). An American capitalist, born at Richford, N. Y. At first he was a bookkeeper and later a partner in a produce commission business, but soon joined his brother, John D. Rockefeller (q.v.), in the oil-refining business at Cleveland, Ohio. From 1865 to 1911 he had charge of the New York business of the Standard Oil Company of New Jersey and during the same period was also president of the Standard Oil Company of New York. He became director of many railroads, banks, trust companies, mining corporations, and gas and electric companies. As one of the directors of the New York, New Haven, and Hartford under the Mellen régime, Rockefeller incurred a share in the popular criticism aroused by the mismanagement of this railroad. He resigned the directorship in 1914, but a few weeks later he and 21 other directors were indicted (under the criminal clause of the Sherman Anti-trust Act, q.v.) on a charge of conspiracy to monopolize transit facilities in New England. The case was called in October, 1915; but after three months the jury disagreed. When the Pujo (q.v.) investigation was going on in Washington (1913) every exertion was made to have Mr. Rockefeller, then in Florida, appear as a witness, but affidavits were made that his life would be endangered by any exertion.

ROCKEFELLER FOUNDATION. A philanthropic trust, incorporated by Act of the New York Legislature of May 14, 1913. By the terms of the Act the trustees and such persons as they might associate with themselves were constituted a body corporate with power to receive and manage funds for the purpose of "promoting the well-being of mankind throughout the world," through charitable, religious, missionary, and educational activities as well as through research and publication. The Foundation received gifts aggregating $100,000,000 from John D. Rockefeller and $48,000 in trust for specific purposes from Mrs. John D. Rockefeller. The management of the Foundation, under the terms of the charter, vests in a self-perpetuating body of trustees, who are practically unrestricted in respect to the business activities they may undertake in the interest of the Foundation. The original board included John D. Rockefeller, Sr., John D. Rockefeller, Jr., President Emeritus Charles W. Eliot, Simon Flexner, F. T. Gates, J. D. Greene, A. Barton Hepburn, C. O. Haight, President Harry Pratt Judson, W. Rose, and S. J. Murphy. The activities upon which the Foundation has entered cover a wide range of affairs. Among the most important was the organization of a world-wide campaign against the hookworm disease; the establishment of the China Medical Commission for the promotion of public health and medical education in China; the creation of an Industrial Relations Investigation Division for conducting a study of the relations of capital and labor; the foundation of a War Relief Commission to coöperate with the Commission for Relief in Belgium; work in coöperation with the Red Cross Society to check the ravages of typhus in Serbia. A favorite method of operation of the Foundation is the subsidizing of independently existing educational or humanitarian institutions. Regular subsidies are granted to the American Academy at Rome, to the New York Association for Improving the Condition of the Poor, to the New York Charity Organization Society, to the Brooklyn Bureau of Charities. Donations from the fund exceeding $2,500,000 have been made to the Rockefeller Institute for Medical Research, and $750,000 was given to Wellesley College.

ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH, The. An institution founded by John D. Rockefeller in 1901 and incorporated under the laws of the State of New York. It is situated at the foot of Sixty-sixth Street and faces the East River, New York City.

As originally incorporated, its purpose was to encourage "medical research with special reference to prevention and treatment of disease." In 1908, however, the charter was amended by Act of Legislature, and its scope enlarged to embrace investigations into questions of hygiene, medicine, surgery and allied subjects, and the nature and causes of disease. In the beginning Mr. Rockefeller pledged $200,000 for 10 years, but at the end of the first year he pledged an additional $1,000,000 towards the erection of the necessary buildings, the present site being chosen in 1902. In 1907 the work was placed on a permanent basis by a gift of $2,620,610 for endowment. The buildings with their equipment cost approximately $900,000. The plant consisted in 1915 of two main departments, the laboratory building and the hospital. There are separate laboratories for (1) pathology, bacteriology, (2) chemistry, (3) physiology and pharmacology, (4) experimental biology, and (5) experimental surgery. The hospital consists of one main building, 11 stories in height, with isolation pavilions. There is an animal house, especially adapted for the care of animals used for experimental purposes. In 1907 a farm was acquired at Clyde, N. J., for the breeding of laboratory animals and the supply of farm products. In 1911 a laboratory was erected at Woods Hole,

ROCKFISH, SUNFISH, ETC.

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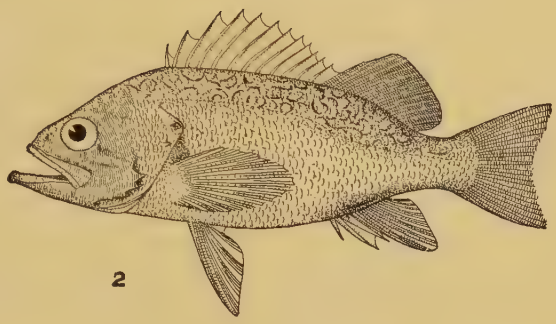

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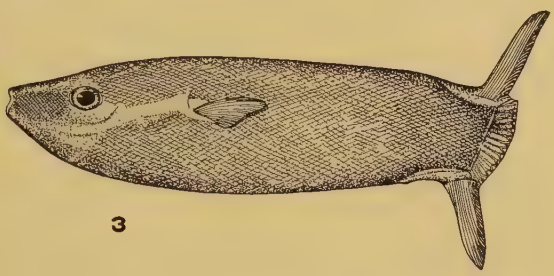

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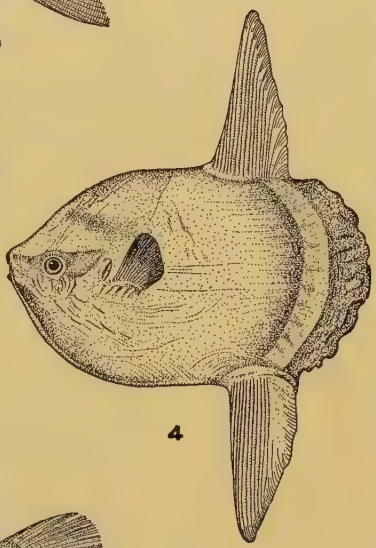

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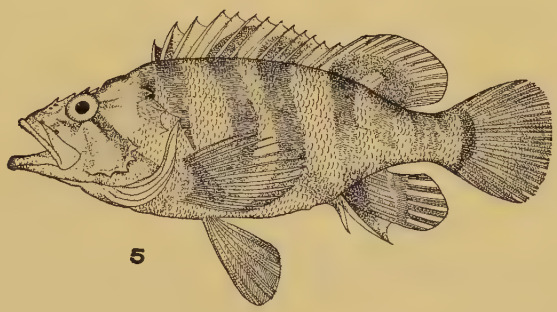

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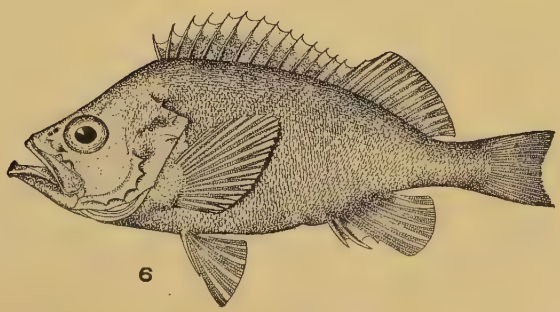

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1. SAND CUSK (Ophidion elongatus).
2. ORANGE ROCKFISH (Sebastodes pinniger).
3. PELAGIC SUNFISH (Ranzania truncata).
4. COMMON SEA SUNFISH (Mola mola).
5. TREEFISH (Sebastodes serriceps).
6. ROSEFISH (Sebastes marinus).

Mass., for the use of the department of experimental biology.

Appointments to the scientific staff are made by the board of scientific directors, of which the president in 1915 was Dr. William H. Welch (q.v.). These positions include members of the institute, associate members, associates, assistants, fellows, and research scholars. The members in 1915 were Simon Flexner, Rufus Cole, P. A. T. Levene, Jacques Loeb, Samuel J. Maltzer, and Alexis Carrel. Positions on the hospital staff are classified as physician to the hospital, assistant physician to the hospital, resident physician, and assistant resident physician. All these positions are salaried, and it is stipulated that discoveries and inventions made by any person receiving emolument from the Rockefeller Institute must be placed freely at the service of the public. The scientific discoveries and investigations of the institute are set forth in the following publications. *The Journal of Experimental Medicine*, of which Simon Flexner (q.v.) is the editor, is issued monthly. Elaborate studies are issued irregularly under the title *Monographs*. The published results of investigations conducted in the laboratory of the institute, or under grants of money from it, are assembled at irregular intervals and republished as *Studies*. Consult *The Rockefeller Institute for Medical Research: History, Organization, and Equipment* (New York, 1914).

ROCKER. A steel instrument used in preparing the metal plate for mezzotint engraving. The process is fully described under MEZZOTINT.

ROCKET. See ARTILLERY; LIFE-SAVING SERVICE; PYROTECHNY; SIGNALING AND TELEGRAPHING, MILITARY; SIGNALS, MARINE.

ROCKET. See DAME'S VIOLET.

ROCK FALLS. A city in Whiteside Co., Ill., 110 miles west of Chicago, on Rock River, on the Hennepin Canal, and on the Chicago, Burlington, and Quincy Railroad (Map: Illinois, E 2). It has manufactories of buggies, agricultural implements, nuts and bolts, etc. Abundant water power is derived from the river. Rock Falls adopted the commission form of government in 1914. Pop., 1900, 2176; 1910, 2657.

ROCK FEVER. See MALTA FEVER.

ROCKFISH. The name of several fishes which haunt rocky places. In the eastern United States the term is applied to (1) the striped bass (*Roccus lineatus*), (2) the rock bass (q.v.), (3) the yellow-finned grouper (*Myctioperca venenosa*) of Florida and southward, which is about 3 feet long and clear olive green, with light green and orange-brown markings, and (4) to a familiar killifish (*Fundulus majalis*).

On the Pacific coast rockfish is a general name for a large group of marine shore fishes of the family Scorpænidæ, of which about 30 genera and 250 species are known. Many bring forth their young alive, the fry at birth being about a quarter of an inch in length. The typical rockfishes of California are those of the genus *Sebastodes*, of which 56 species are recognized by Jordan and Evermann, who monographed the group with much detail in their *Fishes of North and Middle America* (Washington, 1898). On the average they are about 15 inches long and weigh two or three pounds. Most of them are of brilliant hues, with striking markings. Nearly all of these fish are fair eating and furnish the principal part of the marine market supply of California. Consult: G. B. Goode, in *Fishery Industries*, sec. i (Washington, 1884); Eigenmann and Beeson, "Revision . . . of the Subfamily Sebastinæ," in *Proceedings of the National Museum*, vol. xvii (ib., 1894); Jordan and Evermann, *American Game and Food Fishes* (New York, 1902); D. S. Jordan, *Fishes* (ib., 1907). Cf. GROUPER; ROSEFISH.

ROCK'FORD. A city and the county seat of Winnebago Co., Ill., 85 miles by rail west by north of Chicago, on Rock River, here spanned by several bridges, and on the Chicago and Northwestern, the Illinois Central, the Chicago, Burlington, and Quincy, the Chicago, Milwaukee, and St. Paul, the Chicago, Milwaukee, and Gary railroads (Map: Illinois, F 1). It is divided by the Rock River and covers 9 square miles. In the eastern section is the handsome Rockford College (q.v.) for Women. A public library with more than 55,000 volumes occupies a fine Carnegie structure. The city hall, courthouse, Memorial Hall, and the City and St. Anthony's hospitals are prominent features of the city. The Wilgus Medical and Surgical Sanitarium is 2 miles distant to the north, and the Broughton Sanitarium is at the city limits on the south. Good water power and excellent transportation facilities have contributed largely to Rockford's industrial and commercial importance. In the census year of 1909 there was invested in the various industries capital amounting to $22,411,997. The total production was valued at $22,265,740. Furniture, hosiery and knit goods, foundry and machine-shop products, pumps, agricultural implements, leather goods, sewing machines, clothing, and harness are the leading manufactures. The city spent in 1913 for maintenance and operation $618,000, the principal items being: schools, $229,000; streets, $72,000; water works, $82,000; fire department, $77,000; police department, $38,000. Rockford was settled in 1834, laid out in 1836, and chartered as a city in 1852. It was enlarged by the annexation of suburbs in 1890. Pop., 1900, 31,051; 1910, 45,401; 1915 (U. S. est.), 53,761; 1920, 65,651.

ROCKFORD COLLEGE. An undenominational institution for the higher education of women at Rockford, Ill., founded in 1849. It had in 1914–15 property valued at $381,454, including grounds and buildings worth $313,830, an endowment of $208,977, and an income of $92,000. Its library contained about 6000 volumes. The departments are collegiate, music, art, education, home economics, and secretarial, with a total attendance of 240 and a staff of 38. The president in 1915 was Julia H. Gulliver, Ph.D.

ROCKHAMP'TON. The commercial capital of the central division of Queensland, Australia, on the Fitzroy River, 397 miles north by west of Brisbane, by rail (Map: Queensland, G 7). It is the port of the Mount Morgan gold workings. It is a well-built town, with wide and shaded streets, fine government buildings, a town hall, botanical gardens, fine churches, supreme court buildings, etc. A bridge 1160 feet long spans the river. Its harbor for ocean steamers is at Port Alma, 36 miles below, but vessels of 1000 tons ascend to the city. It is an important centre for the frozen meat trade and is the starting point of the Central Railway. Pop., 1901, 19,691; 1911, 20,915.

ROCK HILL. A city in York Co., S. C., 80 miles north of Columbia, on the Southern Railroad (Map: South Carolina, D 2). It is the seat of the Winthrop Normal and Industrial College of South Carolina, a State institution

for women, and contains a Carnegie library and the Fennell Infirmary. Cotton, alfalfa, farm produce, and fruit are extensively cultivated in the surrounding district. Its industries include cotton mills, a large buggy factory, a fertilizer factory, an oil mill, a jute bagging factory, brick plants, sash, door, and blind manufactories, and foundries and machine shops. The Southern Power Company which has electrically developed 200,000 horse power on the Catawba and Broad rivers, near by, is increasing its power greatly. Rock Hill has adopted the commission form of government. Pop., 1900, 5485; 1910, 7216.

ROCK'HILL, WILLIAM WOODVILLE (1854–1915). An American diplomat, traveler, and author, born in Philadelphia. In 1884 he was appointed Second Secretary of the American Legation at Peking, the next year he was promoted to Secretary, and in 1886 he was appointed chargé d'affaires in Korea. Between 1888 and 1892 he made two long journeys through China, Mongolia, and Tibet, accomplishing in disguise daring explorations of the last-named country. Between 1893 and 1897 he was successively chief clerk in the United States Department of State, Third Assistant Secretary of State, and First Assistant Secretary. He served as Minister to Greece, Rumania, and Servia in 1897–99, and then for six years as director of the International Bureau of American Republics. During this period he was also United States Commissioner to China (1900) and Plenipotentiary to the Congress of Peking for the settlement of the Boxer troubles. He was appointed Minister to China (1905), Ambassador to Russia (1909), and Ambassador to Turkey (1911), from which last post he resigned in 1913. He died at Honolulu on his way to take up the duties of adviser to the President of China. His published works ininclude: *The Land of the Lamas* (1891); *Explorations in Mongolia and Tibet* (1893); *Diary of a Journey through Mongolia and Tibet in 1891 and 1892* (1894); *Notes on the Ethnology of Tibet* (1895); *Report of W. W. Rockhill, Late Commissioner to China* (1901); *Treaties and Conventions with or concerning China and Korea, 1894–1904* (1904).

ROCK HIND. One of the groupers (*Epinephelus adscensionis*), well known throughout the western Atlantic and common in rocky places about all the West Indian coasts and islands, where it is known as cabra mora and is regarded

ROCK HIND.

as the best market fish of its kind. It is about 18 inches long, clouded greenish gray, everywhere spotted with orange, and with five dark roundish blotches along the back. See GROUPER.

ROCK HOPPER. See PENGUIN.

ROCK'INGHAM. A town, containing the villages of Bellows Falls, Saxtons River, Cambridgeport, Rockingham, and Bartonsville, in Windham Co., Vt., 84 miles north of Springfield, Mass., on the Rutland Railroad (Map: Vermont, D 7). It contains the Vermont Academy and fine high-school, armory, and public-library buildings. There are paper mills, machine shops, etc. Pop., 1900, 5809; 1910, 6207.

ROCKINGHAM, CHARLES WATSON-WENTWORTH, second MARQUIS OF (1730–82). An English statesman. He was educated at Westminster School and St. John's College, Cambridge. Belonging to an old Whig family, he received many honorary offices and in 1750 succeeded his father in the peerage. In 1765 Rockingham was made Prime Minister, the chief men in his cabinet being Conway, the Duke of Grafton, and the Duke of Newcastle. The government was not a strong one, but it is famous on account of its repeal of the Stamp Act and the passing of other measures to conciliate the American Colonies. In 1766 the Ministry resigned, and Rockingham for many years was an opponent of the King's policy and throughout showed friendship for America. On the resignation of Lord North in 1782 Lord Rockingham again became Prime Minister, the principal men in his cabinet being Fox and Shelburne. Rockingham died on July 1, within a little more than three months after his installation. Consult: *The Letters of an Englishman; in which the Principles and Conduct of the Rockingham Party, when in Administration and Opposition, are freely and impartially Displayed* (London, 1786); G. T. Albemarle, *Memoirs of Rockingham* (2 vols., ib., 1852–53); W. E. H. Lecky, *History of England in the Eighteenth Century* (new ed., New York, 1892–93).

ROCKING STONES. Masses of rock so finely poised as to move backward and forward when pushed by the hand. They are generally formed of granite as being the stone that most easily resists general decomposition. The wearing away of the lower portions is usually the combined result of the sand-blast action of the wind and sand and the disintegrating action of frost or the effect of lichens which disintegrate the feldspar immediately below and contribute to the wasting of the rock. Among the famous rocking stones is the Logan Rock, near Land's End in Cornwall.

ROCK ISLAND. A city and the county seat of Rock Island Co., Ill., 180 miles west by south of Chicago, on the Mississippi River, at the mouth of the Rock River, on the Hennepin Canal, and on the Chicago, Rock Island, and Pacific, the Chicago, Burlington, and Quincy, the Chicago, Milwaukee, and St. Paul, the Davenport, Rock Island, and Northwestern, and the Rock Island Southern railroads (Map: Illinois, C 2). It is the seat of Augustana College and Theological Seminary (q.v.), and has a public library. On Government's Island, near the city, is the United States arsenal and armory, covering an area of nearly 1000 acres and costing about $10,000,000. There are railroad and highway bridges from the city to the island, which in turn is connected with Davenport, Iowa, by a fine highway and railway bridge, built by the United States government. A second railroad bridge across the Mississippi connects the western parts of the two cities. An important railway centre, Rock Island also has large commercial and industrial interests. The dam in the Mississippi, constructed by the Federal government, furnishes extensive water power for manufacturing. The products of the various establishments include farm implements, stoves, brick, lumber, car-

riages, soap, beer, oilcloth, plumbing specialties, building materials, sashes, doors, and blinds. The city has adopted the commission form of government. Rock Island was settled in 1836 and was first incorporated in 1841. Pop., 1900, 19,493; 1910, 24,335; 1915, 27,961; 1920, 35,177.

ROCK KANGAROO, or **ROCK WALLABY.** These animals are adapted to their special habitat by certain modifications of the typical kangaroo structure. The body is more compact, and the tail, not being thickened at the base, is of no use in supporting the weight of the animal, but chiefly aids it in balancing in taking long leaps. The feet are short and the soles exceedingly rough, being thickly covered with horny tubercles, which prevent the animals from slipping. They live in caves and rocky holes and come out at night, leaping one after the other from rock to rock. Six species of the genus *Petrogale* are known, differing in size and coloration. They are natives of Australia.

ROCK'LAND. A town in Russell County, Ontario, Canada, on the Ottawa River and on the Grand Trunk and Canadian Northern railways, 22 miles east by north by rail of Ottawa (Map: Ontario, K 2). Its manufactures include lumber, planing-mill and machine-shop products, sashes and doors. It is a popular tourist resort. Pop., 1901, 1998; 1911, 3397.

ROCKLAND. A city and the county seat of Knox Co., Me., 60 miles south of Bangor, on an inlet of Penobscot Bay and on the Maine Central Railroad and the Bangor Line of the Eastern Steamship Corporation (Map: Maine, C 4). Features of the city are the public library, the United States government building, a handsome and unique soldiers' monument, the county hospital, and the county courthouse. A large harbor and excellent shipping facilities contribute to Rockland's importance as a commercial centre. The city is noted for its extensive lime-burning works, granite quarries, and shipbuilding yards and has also manufactures of iron, carriages, and cigars. The granite quarries of the vicinity have furnished materials for United States government buildings. Pop., 1900, 8150; 1910, 8174; 1915 (U. S. est.), 8184. Originally a part of Thomaston and separately incorporated as East Thomaston in 1848, Rockland received its present name in 1850 and was chartered as a city in 1854. Consult Eaton, *History of Thomaston, Rockland, and South Thomaston* (Hallowell, 1865).

ROCKLAND. A town in Plymouth Co., Mass., 18 miles south-southeast of Boston, on the New York, New Haven, and Hartford Railroad (Map: Massachusetts, F 4). It has some manufactures, of which shoes, tacks, and nails are the most important. There is a public library with 10,000 volumes. Originally a part of the town of Abington of the old Plymouth Colony, Rockland was incorporated as a separate town in 1874. Pop., 1900, 5327; 1910, 6928.

ROCK MONDAY. See PLOW MONDAY.

ROCK OF AGES. The title of a celebrated hymn written by Augustus Toplady (q.v.) in 1776.

ROCK PLANTS. Plants whose natural habitat is associated with areas of rock. With the exception of marine forms (see BENTHOS), rock plants may be classed generally under the head xerophytes (q.v.).

ROCK'PORT. A city and the county seat of Spencer Co., Ind., 31 miles by rail east of Evansville, on the Southern Railway (Map: Indiana, C 9). It is picturesquely situated on bluffs fronting the Ohio River and has a fine courthouse building, a Carnegie library, an orphans' home, and a county farm. There are manufactories of pearl buttons, drain tile, silos, building brick, flour, strawboard paper, etc. Coal, timber, and clay are found in the vicinity. Pop., 1900, 2882; 1910, 2736.

ROCKPORT. A town in Essex Co., Mass., 4 miles by rail northeast of Gloucester, on the Atlantic Ocean and on the Boston and Maine Railroad (Map: Massachusetts, F 2). It has a Carnegie and a Pigeon Cove public library and a public hospital. The village of Pigeon Cove, which comprises the northern part of the town, has some reputation as a summer resort. Rockport is engaged in agriculture and fishing and is noted for its extensive quarries of granite. Isinglass is the leading manufactured product. The United States government is constructing (1915) a breakwater which will greatly improve the harbor here. Pop., 1900, 4592; 1910, 4211. Rockport formed part of Gloucester until 1840.

ROCKPORT. A city and the county seat of Aransas Co., Tex., 159 miles southeast of San Antonio, on Aransas Bay, the terminus of the San Antonio and Aransas Pass Railroad (Map: Texas, D 5). Rockport has considerable trade in fish, oysters, game, and wool. Excellent bathing facilities give the town some reputation as an all-year resort. Rockport was organized in 1867 and in its early days was a cattle-shipping centre of considerable importance. Pop., 1900, 1153; 1910, 1382.

ROCK PTARMIGAN. See PTARMIGAN.

ROCK RABBIT. See HYRAX.

ROCKS, FRAGMENTAL. See CLASTIC ROCKS.

ROCK SALT. See SALT.

ROCK SNAKE. See PYTHON.

ROCK SNIPE. An American gunner's name for the purple sandpiper (q.v.).

ROCK SOAP, or SAPONITE. A soft, claylike, hydrated aluminium-magnesium silicate that is found massive and is of a white or light-gray color. It is greasy to the touch, adheres to the tongue, and is easily cut with a knife. It is used for crayons by painters.

ROCK SPRINGS. A city in Sweetwater Co., Wyo., 258 miles west of Laramie, on the Union Pacific Railroad (Map: Wyoming, B 4). It contains a State hospital, government building, public library, city hall, Elks building, and a Masonic Temple. Coal is extensively mined in the vicinity, and there are farming and cattle-raising interests. Pop., 1900, 4363; 1910, 5778.

ROCK SWALLOW. See CRAG MARTIN.

ROCK TROUT. A family of carnivorous sea fishes (Hexagrammidæ) of the North Pacific. They are mostly of large size, live in kelp about rocks, and furnish good food, although their flesh and bones have a greenish tinge, whence they are sometimes called greenlings. One species of great importance in the Aleutian Islands among several related Alaskan greenfish is the so-called Atka mackerel, which is about 18 inches long, is handsomely colored, exceedingly numerous, and of excellent food qualities. The best known of these fishes, however, is the bodieron (q.v.).

ROCK'VILLE. A city in Tolland Co., Conn., 18 miles by rail northeast of Hartford, on the Hockanum River and on the New York, New Haven, and Hartford Railroad (Map: Connecticut, F 2). The Hockanum River makes a total descent of more than 250 feet through Rockville. The industrial establishments include woolen

mills, silk mills, knitting mills, envelope factories, etc. There are high schools and public libraries and two fine lakes,—Snipsic and Crystal. Rockville was chartered as a city in 1889. Pop., 1900, 7287; 1910, 7997.

ROCKVILLE CENTRE. A village in Nassau Co., N. Y., 19 miles east of New York City, on the Long Island Railroad (Map: New York, B 3). It has a Carnegie library and a Catholic parochial school. There are oyster and fishing interests, and a lace and handkerchief factory. Pop., 1900, 1884; 1910, 3667; 1915 (State census), 5223.

ROCKWEED. See PHÆOPHYCEÆ; SEAWEED.

ROCK'WOOD. A city in Roane Co., Tenn., 66 miles by rail west of Knoxville, on the Tennessee River and on the Cincinnati, New Orleans, and Texas Pacific and the Tennessee Central railroads (Map: Tennessee, F 3). Iron ore and coal occur in the vicinity, and the city has large iron furnaces and lumber and hosiery mills. Pop., 1900, 2899; 1910, 3660.

ROCK WREN. A singular little wren (*Salpinctes obsoletus*) of the southwestern United States, which lives among the loose rocks of the mountain sides, where it places its large globular nest upon a ledge or within some crevice. In spring it utters a loud, sweet, and beautiful song, somewhat like that of the mocking wren. Consult Elliott Coues, *Birds of the Colorado Valley* (Washington, 1878).

ROCKY FORD. A city in Otero Co., Colo., 54 miles by rail east of Pueblo, on the Atchison, Topeka, and Santa Fe Railroad (Map: Colorado, F 3). It contains a Carnegie library and a fine high-school building. It is situated in a rich and extensively irrigated agricultural region, producing cantaloupes (known by the name of the town), sugar beets, and seeds; and there are canning factories, creameries, and a large beet-sugar factory. Pop., 1900, 2018; 1910, 3230.

ROCKY MOUNT. A city in Edgecomb and Nash counties, N. C., 121 miles south of Richmond, Va., near the Tar River and on the Atlantic Coast Line (Map: North Carolina, E 2). It is a commercial centre, carrying on an important trade in cotton and tobacco, and also has large railroad repair shops and manufactures of tobacco, hosiery, and wood products. It was incorporated in 1855. Pop., 1900, 2937; 1910, 8051; 1915, 11,461; 1920, 12,742.

ROCKY MOUNTAIN LOCUST. See LOCUST.

ROCKY MOUNTAIN PARK. See PARK, NATIONAL.

ROCKY MOUNTAINS. A name here used to indicate the assemblage of mountain ranges which form the backbone of North America. They begin in Mexico and extend northward to the westernmost of the Aleutian Islands. On the east they are bordered from near Vera Cruz, Mexico, to the valley of the Mackenzie, by the Great Plateaus, or Great Plains as more commonly termed; and on the west, within the United States, by the Great Basin region, which reaches from the head of the Gulf of California far northward into Canada and separates the ranges from the Sierra Nevada and Cascade mountains.

In Canada the term Rocky Mountains is restricted to the east range of the series of uplifts to which it is applied in the United States. To the west of the range thus designated, in Canada, and separated from it by a broad valley some 700 miles long, trending north and south, are the Gold Mountains, consisting principally of the Selkirk, Purcell, Columbia, and Caribou ranges. The term Canadian Rockies is in current use, however, and includes all of the mountains in Canada which are a direct northward continuation of the Rocky Mountains of the United States.

To the south of the United States the Rocky Mountains include the table-land of north-central Mexico. Their natural termination is attained at the Isthmus of Tehuantepec.

The length of the Rocky Mountain chain from north to south is some 4000 miles and its width between 400 and 500 miles. Within its borders are several mountain systems and a large number of individual ranges, together with several large plateaus, numerous valleys, parks, cañons, etc., as well as multitudes of peaks, ridges, mesas, and buttes. A characteristic of the ranges composing the Rocky Mountain system is their alignment "en échelon." One of the most conspicuous features of the chain, and one which has been used as a basis for dividing it into two portions, is the presence in Wyoming of a broad plateau trending east and west, known as the Laramie Plains. This plateau, with a general elevation of about 7000 feet, reaches from the Grand Plateau in the east nearly to the Great Basin in the west and separates the northern from the southern Rockies. This great pass was chosen for the route of the Union Pacific Railroad, the first of the several transcontinental railroads now in operation. The several ranges composing the southern Rockies are for the most part arranged with their larger axes in a generally north and south direction, while the trend of the northern Rockies, as well as of their component ranges, is in general northwest and southeast.

Within the United States the Rocky Mountain region begins at the Okanogan River in northern Washington. The portion to the north of the Laramie Plains has been termed the Stony Mountains, a revival of the name applied to them by Lewis and Clark during their historic explorations in 1804–06; and the portion of the southern Rockies, situated principally in Colorado, northern New Mexico, eastern Utah, and the surrounding country, has been designated as the Park Mountains.

The Stony Mountains contain many important ranges. In Wyoming the representative uplifts are: the Big Horn Range, which, extending from near the centre of the State about 150 miles northward, ends in Montana. It is due principally to a single great upward fold in the rocks; the east slope is precipitous and the west slope gently inclined. The crest line has an elevation of from 8000 to 13,000 feet, and Cloud Peak, the culminating point, rises 13,165 feet above the sea. The Wind River Range, in the west-central part of the State, presents a fine series of rugged peaks along its crest, at least a dozen of which have elevations in excess of 11,000 feet, the highest being Fremont Peak (13,790 feet). The Teton Range, near the northwest border of the State, is the boldest and probably the finest of the series, and culminates in the Grand Teton, a spinelike peak, rising 13,691 feet above the sea and 7000 feet above Jackson Lake, from which it may be seen to the greatest advantage. The Wind River, Teton, and other neighboring ranges, situated principally in northwest Wyoming, rise from a region some 15,000 square miles in area, which has a general elevation in

excess of 8000 feet and is exceeded in extent among the regions of similar elevation in North America only by the central part of the Park Mountains. From this mountainous plateau of Wyoming, and supplied principally by the melting of the snow on the lofty ranges, the Yellowstone River flows eastward to join the Missouri, and the Snake River flows westward and unites with the Columbia. In central Idaho there is a great region of sharp serrate peaks, the character of which is expressed by the name of the main or Sawtooth Range, by estimate about 13,000 feet high. Topographically this rugged region extends northwest and is known in part as the Bitter Root and the Cœur d'Alêne mountains, which, although not remarkable for their height, are of great extent and important on account of their mines, forests, and fine scenery. In Montana there are also several distinct and important ranges, among which are not less than 23 peaks that exceed 10,000 feet in height above the sea and rise from 6000 to 8000 feet above the neighboring valleys.

To the east of the Big Horn Mountains and separated from them by a portion of the Great Plateaus, 150 miles wide, are the Black Hills, which in a general view are included in the Rocky Mountains. See BLACK HILLS.

The Park Mountains, situated to the south of the Wyoming Plateau, are composed of many distinct ranges having a north and south trend, to which, however, a marked exception is furnished by the Uintah Range in southwest Wyoming and northeast Utah, which consists of a deeply dissected east and west fold or broadly uplifted plateau. Intervening between several of the adjacent ranges, especially in Colorado, there are wide, nearly flat-bottomed valleys which owe their leading characteristics to the depth of the deposits of débris swept into them from the bordering uplands by streams and the wind. These valleys are known as parks and suggested the name for the mountain system in which they occur. Typical examples are furnished by North, Middle, South, and San Luis parks in central Colorado, the broad generally level floors of which have elevations ranging from 7000 to 8000 feet. They are meadows on an extensive scale surrounded by forest-clad slopes and snowy peaks. Their scenery is generally full of charm.

Among the numerous ranges of the Park Mountains in Colorado are the Front or Colorado Range, in view from Denver, the Saguache, Elk, San Juan ranges, etc. A conspicuous feature in the relief is the generally great elevation and the large number of lofty summits. The area above an elevation of 10,000 feet is much larger than any other region with a similar altitude in North America. Among the host of magnificent mountain peaks, there are more than 30 which exceed 14,000 feet, but their height is seldom fully appreciated, owing to the elevation of the neighboring valleys, which reduces their *visual height* to about one-half of their total elevation above the sea. The best known and perhaps most representative are, with their elevations expressed in feet: Gray's Peak, 14,341; Mount Harvard, 14,375; Holy Cross Mountain (q.v.), 14,170; Mount Lincoln, 14,297; Long's Peak, 14,255; Mount Princeton, 14,196; Pike's Peak, 14,108; Uncompahgre Peak, 14,289; and Mount Yale, 14,187. In the opinion of many observers the most magnificent mountain mass in the Park Mountains, largely on account of its isolation, is Sierra Blanca, in southeast Colorado, 14,465 feet.

The Park Mountains extend west into Utah and there include the bold Wasatch Range, with a culminating summit nearly 12,000 feet above the sea. This range is in view from Ogden and Salt Lake City and presents a wonderfully bold escarpment to the west, which sharply defines the west border of the Rocky Mountains for a distance of some 200 miles.

To the southwest of the as yet indefinitely determined border of the Park Mountains is a series of high plateaus termed collectively the Colorado Plateaus, situated principally in Arizona, western New Mexico, and southern Utah, which have elevations ranging from 7000 to 8000 feet and have been deeply dissected by the Colorado River and its tributaries. The explorations of J. S. Newberry, J. W. Powell, and C. E. Dutton in this land of remarkable cañons have made it one of the best-known and to geologists and geographers most instructive portions of the Rocky Mountain region.

In New Mexico the mountains are lower than in Colorado, and the several ranges and numerous isolated volcanic mountains are separated by broad deeply filled valleys. These same characteristics of the relief extend southward into Mexico.

All of the larger divisions of geological history from the Archean to recent times are represented in the Rocky Mountains. Granite, gneiss, schist, and related rocks usually referred to the Archean occur especially in the axial portion of many of the ranges, as the Front or Colorado Range, the Saguache, etc., in Colorado, the Black Hills, Big Horn, Teton, etc. The older recognized sedimentary rocks belong to the Algonkian period and consist largely of quartzites. In the Lewis and Livingston of Montana rocks of this age have yielded interesting remains of large crustaceans related to *Eurypterus*, which belong to the oldest known fauna of the earth. In sandstone of Ordovician (Lower Silurian) age near Cañon City, Colo., the oldest known fossil fishes have been found. Carboniferous rocks, principally marine limestone, occur widely throughout both the Stony and Park mountains. At several localities in Colorado and Wyoming rocks of Jura-Trias age have yielded large quantities of bones belonging to gigantic extinct reptiles. Marine sediments of Cretaceous age, particularly in Montana, are frequently crowded with beautifully preserved shells and particularly a great variety of cephalopods. Tertiary rocks, consisting principally of the sediments of lakes and occurring for the most part in the valley, contain the bones of many genera of extinct mammals, some of them of large size and remarkable character. In beds of similar age, consisting largely of volcanic dust, at Florissant, Colo., immense numbers of fossil insects have been obtained, and near Green River in Wyoming soft shales are crowded with the remains of fishes. Fossil plants, particularly of Lower Cretaceous, Jurassic, and Tertiary times, are also abundant. Valuable coal seams of Cretaceous and Tertiary age occur at many localities.

One of the most remarkable facts concerning the geological structure of the Rocky Mountains is the presence of a series of abrupt folds along their eastern border in which the horizontal strata, several thousand feet thick, underlying the Great Plateaus, are bent upward. Remnants of these same beds occur in several of the ranges

to the west of the Front Range, at an elevation of 5000 or 6000 feet above the portions not affected by mountain-building forces. At many localities along the east base of the Front Range, from New Mexico northward far into Canada, the abrupt folding of the rocks is shown by the nearly vertical position of the eroded border of the strata remaining. At times the folds were overturned eastward, so that the beds in their eroded basal portions dip westward. In northern Montana a still more intense movement resulted in the fracturing of the rocks in an overturned fold, producing a nearly horizontal fault or thrust plain, in connection with which, as reported by Bailey Willis, Algonkian rocks were carried 7 miles eastward and rest on Cretaceous strata.

In general the various ranges composing the Rocky Mountain chain are due to upward folds or anticlinals in sedimentary and igneous rocks. In general, also, as shown by the north and south trend of the longer axes of the folds, the direction in which the force acted which caused the rocks to bend was east and west. The principal movements which upraised the mountains occurred at the close of the Mesozoic, as is shown by unconformities between Mesozoic and Tertiary beds.

The upheaval of the mountains was followed by erosion. Nearly all of the scenic features which now attract the eye are due to the work of streams and glaciers which have deeply sculptured the upheaved mountain blocks. The broad valleys, including the parks of Colorado, etc., are due to the upraising of their bordering mountains; but the cañons, such as the Yellowstone, Arkansas, Colorado, and other streams flow through, are the result of abrasion by the débris-charged rivers themselves. The infinitely varied secondary valleys and cañons and the multitude of gorges, gulches, amphitheatres, and other similar incised features of the relief are due to erosion, while the countless mesas, buttes, pinnacles, etc., which rise above the general level of the surrounding country are remnants of ancient uplands spared by the erosive agencies. Erosion or earth sculpture has also brought out the characteristic features of the Black Hills in which the more resistant rocks stand in relief and the weaker beds underlie valleys, and has given to the several regions of "bad lands" their unique topography. In addition to the numerous ranges due to lateral pressure and consequent upward folding there are many elevations due to volcanic agencies. Mountains built by volcanic eruptions are numerous in Arizona and New Mexico. To this class belong San Francisco Mountain and Mount Taylor, situated farther east, in sight of which there are a large number of "volcanic necks" exposed by the removal of the craters which once inclosed them. East of the Front Range in New Mexico and well out in the Great Plateaus there are a number of conspicuous volcanic craters, of which the leading example is Mount Capulin, 2750 feet high above the surrounding plain and with a crater on its summit nearly a mile in diameter. The Spanish Peaks, in southeastern Colorado, furnish admirable examples of the deep erosion of large volcanic mountains. In western Wyoming and extending across southern Idaho are the basaltic lavas of the Snake River Plains, one of the most wonderful exhibits of its kind in the world, associated with which there are numerous volcanic craters. In the region of Yellowstone Park there are great accumulations of rhyolitic lava, of older date than the basalts of Idaho, but still retaining some of their volcanic heat, as is made manifest by the numerous hot springs and geysers. Associated with volcanic eruptions is the injection from below of molten or plastic magmas into the rigid rocks composing the outer portion or crust of the earth. These intrusions in part occupy fissures and form dikes, but at times were forced between stratified beds and produced intruded sheets of igneous rocks, perhaps many scores of square miles in area, and under other conditions formed cistern-like intrusions termed laccoliths, which raised the rocks above into domes. In the Rocky Mountains there are numerous examples of each of these varieties of igneous intrusions, many of which have been laid bare by erosion. Of these the most remarkable are the laccoliths forming the Henry Mountains in southern Utah, where several intrusions in previously horizontal rocks elevated domes measuring 3 to 5 miles in diameter and from a few hundred to fully 7000 feet high. These mountains furnished the type of a class of uplifts not previously recognized. Other similar laccolithic mountains occur in southwest Colorado and about the Black Hills in South Dakota and have been recognized elsewhere.

Perennial snow banks and miniature glaciers occur in the mountains of Colorado and on the Teton Range in Wyoming. In northern Montana small glaciers are frequent and in the Canadian Rockies form a conspicuous feature in the magnificent scenery. The best known is perhaps Illicilliwaet Glacier, near Glacier House, on the line of the Canadian Pacific Railroad. Other glaciers occur in the higher portions of the mountains throughout Alberta. The glaciers are all of the alpine type and from Montana northward are remnants of great ice sheets which covered the mountains during the Glacial epoch. Many of the more conspicuous features in the North Rockies, such as the deep, steep-sided valley, with rounded or U-shaped bottoms, numerous lakes and side alcoves from which the streams descend in cascades, are due to the former glaciers which flowed away from the several ranges. The summit portions of the Big Horn, Teton, and other ranges in Wyoming are glaciated, as is also a large area in the region of great mountains in Colorado. Nearly all of the numerous and frequently exceedingly beautiful lakes of the Rocky Mountain region are due to the work of glacial ice. Those near the crests of the higher ranges are for the most part rock basins, while those at lower altitudes and especially the long narrow lakes in the larger valleys are held by morainal dams.

The chief industry throughout the Rocky Mountains from Alaska to Mexico is mining. Silver, gold, and copper are the leading metals produced. Medium-grade coals of the cretaceous formations are also mined extensively. Next in importance is stock raising, and particularly cattle raising, for which the nutritious bunch grass, growing mostly below the lower limit of the forests, furnishes abundant nourishment. Agriculture is of local importance, and with certain exceptions, mostly in western Idaho and adjacent portions of Washington, is dependent on irrigation. At present seven railroads (six in the United States and one in Canada) cross the chain, and another to the north of the Canadian Pacific Railroad is projected. The forests of the

mountains are economically important, not only as a source of lumber, but also because they serve to regulate the flow of streams used for irrigation. For these reasons 21 forest reserves, with a total area of over 38,000 square miles, have been established in the portion of the Rocky Mountains belonging to the United States, and similar provisions have been made in Canada. One of the chief characteristics of the Rocky Mountain region is its small rainfall. It has the minimum cloudiness and the minimum relative humidity in the United States. Strong sunshine, dry air, and large temperature ranges prevail. A persistence of winter high-pressure and summer low-pressure conditions characterize it. Comparatively few cyclonic storms cross it.

Among the economic assets of the Rocky Mountains should also be included their magnificent scenery and healthful and invigorating climate. Although thousands of people visit them each year in search of health and recreation, the great benefits to be reaped in these directions are as yet only partially appreciated. The portions most attractive to travelers are the Yellowstone National Park and the Grand Cañon of the Colorado, each of great natural beauty.

Flora. The flora of the Rocky Mountains is largely derivative. With the exception of southern New Mexico and Arizona, which belong botanically to the Mexican Plateau, and the extreme northern portion, which merges with that of the Pacific coast, the flora of the whole Rocky Mountain region is essentially homogeneous at corresponding altitudes. Scarcely 20 per cent of the Rocky Mountain plants are found in the East. The Rocky Mountain flora is especially allied to that of the California or Sierra Nevada region. The principal forest trees are supposed to have migrated from a centre located between north-central California and Puget Sound. The upper limit of tree growth, or cold timber line, rises towards the south, having an elevation of 9000 feet on the international boundary and 11,000 to 12,000 feet in Colorado. In the Stony and Park mountains and thence southward there is also a lower limit of tree growth, determined mainly by lack of humidity. As far north as Idaho and southern Wyoming the larger valleys are below this dry timber line, but in Canada the forests are continuous across mountain and valley. The forests of the whole region are overwhelmingly coniferous, and with the exception of two alpine junipers none of the coniferous trees are common to the Appalachian region, though the latter has closely allied corresponding species, some of which have been erroneously identified with those of the Rockies. The deciduous element of the southern Rocky Mountain forests is confined in general to edaphic situations along watercourses. There are about 10 pines, and the most characteristic tree of the whole region is the Western yellow pine (*Pinus ponderosa*). The nut pine (*Pinus edulis*) and the *Pinus chihuahua* are the chief species confined to the southern portion, while the mountain pine (*Pinus monticola*) and the black pine (*Pinus murrayana*) are found chiefly in the north. Of the spruces the *Picea engelmanni* is the most common throughout the region, though generally seeking higher altitudes (nearly 9000 feet in the south). Other spruces, notably the *Picea columbiana*, are more common in the north, and a northern habitat is also preferred by the firs (*Abies grandis* and *nobilis*), the Western hemlock (*Tsuga mertensiana*), and the tamarack (*Larix americana*). Shrubby conifers, such as junipers, are found chiefly in the arid southwestern ranges and above the timber line. There are six species of oak, but all rather small and scrubby, and the other deciduous tree families are similarly ill represented. Sycamores, the New Mexican locust, and mulberries grow in the south, and the rivers throughout the region are lined with cottonwood, balsam poplar, and willows. On the level plateaus the predominating flora is of the sagebrush type, represented by the genera *Artemisia, Atriplex, Eurotina,* and *Bigelovia,* but in the southwest the plains are nearly desert, with the characteristic desert flora. Above the timber line the alpine flora closely resembles the flora of the Arctic region. Some of these polar plants were probably carried over by the flows of ice which emanated from the Arctic circle. Among all the flowering plants of the Rocky Mountains the families best represented are, in the order named, the Compositæ, Gramineæ, Papilionaceæ, Cyperaceæ, Ranunculaceæ, Cichoriaceæ, Polygonaceæ, Onagraceæ, and Umbelliferæ. Of these the first two together include about 25 per cent of all the species.

Fauna. The Rocky Mountains are peculiar only in such features as depend upon altitude and are correlated with climate and vegetation as locally determined by height above the sea and consequent low temperature. The fauna of all North America is remarkably diffuse and uniform, so that it is considered indivisible by any well-marked distinctions; nevertheless certain zones of life roughly bounded by summer isothermal lines have been recognized as Boreal, Hudsonian, Canadian, Alleghanian, Carolinian, etc., in succession from north to south. These are reproduced in the Rocky and other high ranges of the West. The height above the general base level at which such life zones will be found depends upon the latitude. Thus, at the northern extremity of the range, near the mouth of the Mackenzie, not only the summits but the base of the range is within the boreal zone; but at the southern extremity in New Mexico the base exhibits a Carolinian or even warmer type of fauna, and one must climb 13,000 or 14,000 feet to find upon the peaks arctic weather and arctic plants and animals. In these restricted summit areas one finds the animals peculiar to the region; in the valleys and parks there is little that is distinctive. The slide rock and bowldery moraines up to a height of 13,000 feet are habitats of the pika or cony, a little-known animal resembling a young rabbit. When one has risen considerably, local specialties begin to appear. Thus, in a medium latitude (say Montana), at about 9000 feet, one rises above the sagebrush, the Douglas fir, and the black pine, with their host of valley and plain animals, and into forests of alpine fir, white-bark and Engelmann's pines, which indicate a climate equivalent to that about Hudson Bay. Here are breeding snowbirds (*Junco*), the nutcracker, Canada jay, kinglet, and other northerly birds. This zone extends to the timber line and forms the normal upward limit of the wapiti, moose, and mule deer, the grizzly and black bears, the wolverine, many mice, squirrels, and the smaller carnivores that prey upon them. At and near the timber line one begins to find among the stunted trees and plants animals which do not come lower down, but spend their lives altogether there and upon the treeless summits

above it, and these are the really characteristic mountain animals; and yet with very few exceptions (the sewellel is most conspicuous) they are the same as those of subarctic America generally or of the high ranges of the Pacific coast, or different only in specific details. Such among the larger animals are the bighorn and the Rocky Mountain white goat (qq.v.). The former is practically a circumpolar form, and the latter is numerous at sea level in the far north, but is scarce in the United States. The bighorn is still to be found as far south as San Francisco Peak in Arizona. Along with these two game animals are several small ones peculiar to the heights. One of the most characteristic is the lemming mouse (*Phenacomys orophilus*), an arctic form that burrows in the moss of the alpine meadows; another is the whistler, a marmot (*Arctomys*), inhabiting these heights only towards the north. This, with a weasel which descends in winter when the small animals are hibernating or living upon their stores in underground burrows and when the sheep have migrated below the snow line in order to find browse and pasturage, constitutes the list of peculiarly Rocky Mountain mammals. On the heights, however, breed certain birds, a species of ptarmigan, the rosy finches (*Leucosticte*), and an occasional golden eagle or great owl. The mountain tops are also visited every summer by migratory birds which nest in their heights rather than in the Arctic-circle nurseries.

The general list of animals of the lower levels of the Rocky Mountain region is a very long one and includes many which are distinguished as local or geographic races or subspecies of more widely distributed forms. The bison, pronghorn, and the white-tailed deer range throughout the valleys and climb the heights to a considerable altitude in summer, and in the north caribou are common. The deer generally climb to 1000 feet or more above the uppermost trees in summer. In winter they are found from 3000 to 6000 feet below their summer range. But the bison is extinct, the wapiti remains only from northwestern Wyoming northward, and the pronghorn is scarce. Among the carnivores, grizzly and black bears, the puma, wildcat, wolverine, otter, marten, fisher, long-tailed weasel, black-footed ferret, badger, striped and spotted skunks, red fox, kit fox, raccoon, and cacomixl make a long list attractive in early days to trappers. Rodents include a large number of local species of mice, wood rats and voles, the beaver (now greatly reduced), muskrat, and several hares, one or two of which are peculiar; and many species or races of burrowing gophers and of arboreal and terrestrial squirrels. The same principles apply to the birds, of which about 400 species and varieties have been recorded as occurring in the central Rocky Mountain region, of which about 250 are known to breed there. A type of resident bird is the rosy finch, which rarely descends below timber line. A goodly list of reptiles and batrachians and fishes may be compiled, the last group distinguished by the predominance of salmonoids. Several species of the Pacific coast salmon regularly reach the Rocky Mountains by ascending the Columbia, Fraser, and more northerly rivers. Insects abound, bees and butterflies follow the flowers, and this region is the headquarters of the locust tribe in America.

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ROCKY MOUNTAIN SPOTTED FEVER. See Spotted Fever, Rocky Mountain.

ROCKY MOUNTAIN SHEEP. See Bighorn.

ROCKY MOUNTAIN SUBREGION. A zoögeographical subdivision of the Nearctic region, embracing the mountainous country between the North American plains and the summits of the Sierra Nevada and northern Coast ranges.

ROCKY MOUNTAIN TROUT. See Dolly Varden Trout.

ROCKY MOUNTAIN WHITE GOAT. A goat antelope (*Oreamnus montanus*) of the higher mountains of western North America. The outer hair is long, especially about the fore quarters, and has beneath it a woolly underfur. It stands about 3 feet high at the shoulders, which are somewhat arched or humped, while the head is carried low. The nose is hairy, there is a beard, and the horns, present in both sexes, are slender, smooth, backward-curving, 8 to 10 inches long, and black, which is also the color of the small hoofs. The nearest relatives of this animal are the chamois and serow, but its appearance is very different from that of either. Its home is the summits of the mountains from the "high sierras" of California and the central Rocky Mountains to Alaska, but it has become rare south of British Columbia. Its long silky coat, which the Indians were wont to weave into curious blankets, and its pure white and highly protective color, indicate a snowy habitat, and this animal is an inhabitant of the glacial peaks and the great snow fields alone, rarely coming down even as low as the timber line, but finding its forage among the alpine pastures that border the glaciers. It climbs with astonishing agility, picks its way along cliffs and ledges where the gales blow the snow away as fast as it falls, or feeds upon the highest grassy slopes, so steep that they are last to hold the snowfall of winter and earliest to be swept clean by the spring avalanches. It moves in beaten trails, often the only means the hunter has of following it, and in some narrow places the treading of hoofs for countless generations has actually worn deep paths in the solid granite. Their flesh is good eating, and their hides command a large price when well made into robes or rugs. Two kids are usually produced in the spring and remain

with the parents until the next spring, forming a family party which moves about in company, but no large flocks are ever found. Consult Baillie-Grohman, *Fifteen Years' Sport . . . in the Hunting Grounds of Western America* (London, 1900), and Stone and Cram, *American Animals* (new ed., New York, 1914). See HUNTING BIG GAME and Plate of GOAT ANTELOPES.

ROCO'CO (Fr., apparently coined from *rocaille*, rockwork, from *roche*, ML. *roca*, rock). The name given to a late and fantastic phase of the Renaissance which prevailed in France, Germany, and other parts of central Europe during most of the seventeenth and the first half of the succeeding century. It was really a subspecies of the baroque style of architecture and decoration. It played extravagant tricks with design, showing no restraint in its caprice. It was most successful in rustic work and rockwork, fountains, gardens, and pavilions. It broke all the rules of design and composition drawn up by the purists of the Renaissance and aimed at broken and curved lines and surfaces, irrational details, and vivacious restlessness of effect. Its most monumental example in architecture is the Zwinga Palace, Dresden (1711–22). See INTERIOR DECORATION.

ROCROI, rō'krwä'. The capital of an arrondissement in the Department of Ardennes, France, 15 miles northwest of Mézières, situated on an extensive plateau 1300 feet above the sea, surrounded by the Forest of Ardennes (Map: France, N., K 3). Pop., 1901, 2176; 1911, 2116. It is memorable for the victory gained by the Duke of Enghien (the great Condé) over the Spaniards, May 19, 1643, in which battle a century's reputation for invincibility enjoyed by the Spanish infantry was destroyed.

ROD (AS. *rōd*, OHG. *ruota*, Ger. *Rute;* possibly connected with Lat. *rudis*, staff, *radius*, rod, staff, spoke, semidiameter, Skt. *rudh*, to grow). A measure of length equivalent to 5½ yards, also called a pole. In surveying (q.v.), an instrument used in taking levels. See SURVEYING INSTRUMENTS.

ROD, rōd, EDOUARD (1857–1910). A French author, born at Nyon, Switzerland. He studied philology at Bonn and Berlin, went to Paris, and became (1884) editor of *La Revue Contemporaine.* In 1887 he was chosen professor of comparative literature at Geneva, but he soon resigned. In 1899 he visited the United States on a lecture tour. His first novels were naturalistic, *La femme de Henri Vanneau* (1884). With *La sacrifié* (1892) Rod passed under the influence of Tolstoy. This appears most clearly in *Michel Tessier* (1893–94), but also in *Les rochers blancs* (1895), *Pastor Naudié's Young Wife* (trans. 1899), and *Au milieu du chemin* (1900). He also wrote: *L'Inutile effort* (1903), *Un vainqueur* (1904), *L'Indocile* (1905), and *L'Ombre s'étend sur la montagne* (1907). *Le réformateur* (1906), a drama, has Rousseau for its hero. *Dante* (1891), *Stendhal* (1891), *Idées morales du temps présent* (1892), and *Etudes et nouvelles études sur le XIXème siècle* (1888 et seq.) are critical studies. Consult Firmin Roz, *Edouard Rod: Biographies citique* (Paris, 1906), and Winifred Stephens, *French Novelists of To-Day* (New York, 1914).

RODAS, rō'ḍàs. A town of the Province of Santa Clara, Cuba, 55 miles west of the city of that name (Map: Cuba, E 4). Its chief productions are sugar and fruits. Pop., 1899, 3390; 1907, 3306.

RODBERTUS, rōd-bĕr'tus, JOHANN KARL (1805–75). A German economist, founder of the scientific or conservative school of Socialism. He was born Aug. 12, 1805, in Greifswald, where his father was a professor of Roman law. He studied law at Göttingen and Berlin and served from 1827 to 1832 in the Prussian justiciary. By 1837 he had formulated his social platform and in that year published *Die Forderungen der arbeitenden Klassen.* Elected to the National Assembly in 1848, he was Minister of Education in the Auerswald-Hansemann Ministry for a fortnight and in 1849 was a leader of the Left Centre. Socialism, as defined by Rodbertus, was to be a gradual evolution; hence his acquiescence in a monarchy and his break with the Democrats as a political party. He regarded the social question as a purely economic one. His works include: *Zur Erkenntnis unserer staatswirthschaftlichen Zustände* (1842); *Soziale Briefe,* addressed to Julius von Kirchmann (1850–51); *Der Normalarbeitstag* (1871); *Beleuchtung der socialen Frage* (1875). His statement of his theory of crises, contained in his *Soziale Briefe,* has appeared in an English translation under the title of *Overproduction and Crises* (New York, 1898). Consult: R. T. Ely, *French and German Socialism in Modern Times* (New York, 1898); the sketch in Stegmann and Hugo, *Handbuch des Sozialismus* (Zurich, 1897); Karl Jantsch, *Rodbertus* (Stuttgart, 1899).

RODD, SIR JAMES RENNELL (1858–). An English diplomatist and poet. He was educated at Balliol College, Oxford, where he won the Newdigate prize with a poem on Sir Walter Raleigh (1880). After 10 years in the diplomatic service in 1893 he was placed in charge of the British agency at Zanzibar, and was present at the skirmishes at Pumwani and Jongeni. As principal secretary to the British agency in Egypt he was stationed at Cairo in 1894–1901 and then for three years was Secretary of the Embassy at Rome. In 1897 he was sent on an important mission to King Menelik of Abyssinia. From 1904 to 1908 he was Minister to Sweden and thereafter Ambassador to Italy. Rodd was knighted in 1899, in 1905 he received the G. C. V. O. and in 1915 the G. C. M. G. His volumes of verse comprise: *Songs of the South* (1881); *Poems in Many Lands* (1883); *Feda and Other Poems* (1886); *The Unknown Madonna* (1888); *The Violet Crown and Songs of England* (1891); *Ballads of the Fleet* (1897). In prose Rodd's publications include: *Frederick, Crown Prince and Emperor* (1888); *Customs and Lore of Modern Greece* (1892); *Sir Walter Raleigh* (1904); *Princess of Achaia and the Chronicles of Morea* (2 vols., 1907).

ROD'DICK, SIR THOMAS GEORGE (1846–). A Canadian physician. He was born at Harbor Grace, Newfoundland, and was educated at the Truro Normal School, Nova Scotia, and at McGill University. He was lecturer on hygiene at McGill in 1872–74, demonstrator in anatomy (1874–75), professor of clinical surgery (1875–90), professor of surgery (1890–1907), and dean of the McGill medical faculty (1901–08). During the Canadian Northwest Rebellion in 1885 Roddick organized the medical service for the expeditionary force and was in charge of it in the field. In 1874 he began general practice in Montreal and became prominently connected with several hospitals. He was elected president of the Canada Medical Association and in 1896 president of the British Medical Associa-

tion, being the first colonial physician to fill that office. He was a conservative member of the Dominion House of Commons in 1896–1904. He was knighted in 1914.

RODÉ, rôd, JACQUES PIERRE JOSEPH (1774–1830). A French violinist, born at Bordeaux. He studied under Fauvel in his native place and later under Viotti at Paris. At the opening of the Conservatoire, in 1794, he was appointed professor of the violin. In 1800 he was appointed solo violinist to Napoleon. In 1803 he went with Boieldieu to Russia, where he remained for five years as solo violinist to Alexander I. Afterward, at Vienna, Beethoven wrote for him the *Romance*, op. 50. He went back to Paris in 1828, but was unfavorably received and made his final withdrawal to Bordeaux. He wrote 13 violin concertos; the important and much-used "24 caprices en forme d'études, dans les 24 tons de la gamme"; études; and 3 books of violin duos. His compositions are still highly regarded by violinists. He died at Bordeaux.

RODENBACH, rō'den-bäg, GEORGES (1855–98). A Belgian author, born at Tournai. With Maeterlinck and Verhaeren (qq.v.) he belongs to the nineteenth-century literary revival in Belgium. He was a Symbolist, of the melancholy and sentimental type. After 1887 he lived in Paris. He wrote: *Le foyer et les champs* (1877); *Les tristesses* (1879); *La mer élégante* (1881); *La jeunesse blanche* (1886); *Le règne du silence* (1891); *Les vies encloses* (1896); *Le miroir du ciel natal* (1898). His best novel, *Bruges la morte* (1892; new ed., 1908), presents vividly the sleepy, dreamy aspect of an old Flemish city.

RODENBERG, rō'den-bĕrK, JULIUS (1831–1914). A German author, born of a Jewish family named Levy at Rodenberg in Hesse. He studied law at Heidelberg, Göttingen, Marburg, and Berlin, but devoted himself to literature and to travel, and edited at Berlin first the *Bazar* and then the *Salon*, until in 1874 he founded the important *Deutsche Rundschau*, of which he remained editor. He published in verse, *Sonnette für Schleswig-Holstein* (1851), *König Heralds Totenfeier* (1853; 3d ed., 1856), and *Lieder und Gedichte* (1863; 5th ed., 1880); sketches of life and travel; several romances, *Die neue Sündflut* (1865), *Von Gottes Gnaden* (1870), *Die Grandidiers* (2d ed., 1881), *Herrn Schellbogens Abenteuer* (1890); also a biography of Franz Dingelstedt (1891). Consult the memoirs *Erinnerungen aus Jugendzeit* (Berlin, 1899) and *Aus der Kindheit; Erinnerungsblätter* (ib., 1907).

RO'DENBOUGH, THEOPHILUS FRANCIS (1838–1912). An American soldier and author, born at Easton, Pa., and educated at Lafayette College. He served in the Civil War, participating in the campaigns of the Army of the Potomac and losing his right arm at Winchester. After the war he was inspector general in Kansas and major of the Forty-second Infantry, was retired in 1870 as colonel, in 1871 became deputy governor of the Soldiers' Home, Washington, D. C. He was assistant inspector general of New York State (1880–82) and from 1890 to 1901 chief of the Bureau of Elections, New York City, and in 1904 was advanced to the rank of brigadier general retired. He wrote: *From Everglade to Cañon with the Second Dragoons* (1875); *Afghanistan and the Anglo-Russian Dispute* (1885); *The Army of the United States* (1896); *Sabre and Bayonet* (1897). He contributed articles on military science to the NEW INTERNATIONAL ENCYCLOPÆDIA.

RODENTIA, rō-dĕn'shī-ȧ (Neo-Lat., from Lat. *rodentia*, nom. pl., sc. *animalia*, animals, from pres. p. of *rodere*, to gnaw; connected with Skt. *rada*, tooth). The largest known order of mammals, the rodents or gnawers, containing 20 or more families comprising several thousand species, distributed throughout the world, possibly excepting Australia and New Zealand. The largest, the capybara, is not so large as a hog, while some, as the mice, are very small. The order is distinctively characterized by its dentition, especially by the total absence of canines and the paramount importance of the front teeth or incisors. These are usually two in each jaw, separated by a considerable vacant interval from the molars. They are very large, reach far back into the skull, and continue to grow from persistent pulps as fast as their tips, or cutting edges, are worn away. They are coated on the front with hard enamel, and as the softer dentine of the remainder of the tooth wears away more rapidly, the cusp of each tooth takes a chisel-like edge and its sharpness is maintained. In some groups the molar teeth are also perennial and grow from persistent pulps. Another interesting fact is that in many groups, such as that of the rats and mice, there are no milk teeth. The molar teeth, of which there are usually three on each side, one in each jaw, have flat crowns with ridges of enamel, which make them highly effective as grinders. The stomach is simple; the intestines are very long; the cæcum is often large, sometimes larger than the stomach itself. The brain is not large, and that of some rodents is nearly smooth, but in many families exhibits a considerable degree of convolution. The rodents are not generally distinguished for sagacity, although some of them, as the beaver, exhibit remarkable instincts. They bear important relationships to mankind, chiefly as pests highly injurious to agriculture or obnoxious to the housekeeper; but some yield valuable furs or are useful in other ways. The living rodents are grouped in two suborders, according to the arrangement of the incisor teeth. In the suborder Duplicidentata, which includes only hares, rabbits, and pikas, there are a pair of small accessory incisors in the upper jaw back of the functional pair. In the other suborder, Simplicidentata, there are only two incisors in each jaw. This suborder includes three sections: (1) Hystricomorpha, containing rodents with tibia and fibula distinct, a hairy muzzle, and 20 teeth; (2) Myomorpha, rodents with tibia and fibula united, a naked muzzle, and 16 teeth; (3) Sciuromorpha, rodents with tibia and fibula distinct, a naked muzzle, and 20 or 22 teeth. See HARE; PIKA; PORCUPINE; RAT; SQUIRREL.

Fossil Rodents. The rodent order probably arose some time during the earlier Eocene in North America, as typical rodents are found in the Middle Eocene, and by the end of the Eocene period all the great groups of the order were differentiated. The probability is that the rodents arose from the early Insectivora. It is noteworthy that as yet no intermediate forms have been found to connect the two great rodent groups, the Simplicidentata and the Duplicidentata, and a diphyletic origin is possible.

The rodents very early underwent a remarkably wide geographical distribution and by the end of the Eocene they were represented in North

and South America, Europe, Asia, and Africa, and some existing groups seem to have been much more widely distributed than at present. The Duplicidentata are represented at the base of the Miocene in both Europe and North America by the existing families Lagomyidæ and Leporidæ, and no extinct families are known. Of the Simplicidentata the squirrels occur first in the Upper Eocene of Europe, and later in the White River beds of the Lower Miocene of North America. The earliest of the beavers (*Steneofiber*) occurs in the White River formation and in the Miocene of Europe. The porcupine-like forms attained their greatest development in South America. The rats and mice first appear in the Upper Eocene of Europe in the genus *Cricetodon*, and in North America *Eumys* of the Lower Miocene is an early representative. Although nearly all the rodents have been quite small, there are notable exceptions in *Megomys* of the South American Pampæan formation, a form "nearly as large as an ox," and in *Castoroides ohioticus*, a North American rodent which must have equaled the black bear in size. This animal has been erroneously described as a giant beaver, but its relationship to the porcupines is now known to be closer.

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ROD'ERIC (?–c.711). King of the Visigoths in Spain (710–711). He became King after the overthrow and death of Witiza, but almost all details of his reign are legendary or else open to dispute. According to one account the sons of Witiza joined with some malcontent Visigothic nobles, among whom was a Count Julian, and summoned to their aid the Arab chief who had just finished the conquest of Mauretania. Others assert that the country groaned under the tyrannical government of Roderic, that his licentious behavior had disgusted many of his nobles, and that the people were ripe for a revolution when the Moslem invasion took place. Both are agreed as to the time and mode of the invasion; but the Arab historians brand Count Julian with treachery, as not only voluntarily surrendering Ceuta, the key to the country, but actually guiding the Berbers and Arabs under Tarik into Spain. A landing was effected at Algeciras in 711, and, in spite of vigorous opposition from the Governor of Andalusia, Tarik marched on, routing Roderic's chosen cavalry, which had been sent to oppose him. Roderic hastened at the head of an army to oppose the invaders, who had been reënforced from Africa and by rebels. The two armies met near Vejes de la Frontera, and July 19 the decisive battle was fought. It is probable that the Christians would have been victorious but for the treachery of the King's Gothic enemies. The Saracens won a complete victory, which opened the way to the speedy conquest of Spain. Roderic's fate is unknown, and many legends have been current about his end. Consult Eduard Saavedra, *Estudio sobre la invasión de los Arabes* (Madrid, 1892), and *Cambridge Medieval History*, vol. ii (Cambridge, 1913).

RODERICK DHU, dōō. In Scott's *Lady of the Lake*, an outlaw chieftain, overcome and made prisoner by Fitz-James.

RODERICK RANDOM. A novel by Tobias Smollett (1748). Tom Bowling and Jack Rattlin are amusing naval characters, and the story, though coarse, is spirited and entertaining.

RODEZ, rô'dĕz' *or* rōō'dĕz'. The capital of the Department of Aveyron, France, situated on the crest and slope of a hill, on the north bank of the Aveyron, 148 miles northwest of Montpellier by rail (Map: France, S., G 4). Its streets are steep, narrow, winding, and dirty; but the promenades around the town are pleasant. The cathedral, with a lofty clock tower, is a Gothic structure, dating from the thirteenth century. Other noteworthy buildings are the restored Romanesque church of St. Amans, the modern church of the Sacred Heart, the bishop's palace, several mediæval houses, and the Renaissance Hôtel d'Armagnac. There are ruins of a Roman amphitheatre, and a restored Roman aqueduct supplies the city with water. A variety of woolen cloths are manufactured, cheese of a highly esteemed quality is made, and there is a large trade in cattle and mules. Rodez is the ancient Segodunum, the capital of a Gallic Arvernian tribe, the Rutheni, whence the mediæval Latin name, Rutena, and the modern name. It was the capital of the old County of Rouergue. Pop., 1901, 16,105; 1911, 15,386.

RODGERS, rŏj'ĕrz, Christopher Raymond Perry (1819–92). An American naval officer. He was born in Brooklyn and in 1833 entered the navy as a midshipman. He saw active service against the Seminole Indians in 1839–41 and in the Mexican War. From 1859 to 1861 he was commandant of midshipmen in the Naval Academy. At the beginning of the Civil War he was placed in command of the frigate *Wabash* and rendered his first important service at Port Royal (November, 1861). In March, 1862, he commanded an expedition to St. Augustine and St. Marys River and at the capture of Fort Pulaski had charge of the naval forces operating in the trenches. In the attack on Charleston (1863) he was fleet captain. He afterward commanded the steam sloop *Iroquois* and the *Franklin* and was on special service in Europe until 1872, when he was made chief of the Bureau of Docks and Yards. He was superintendent of the Naval Academy in 1874–78 and again in 1881. During his naval service he rose to the grade of rear admiral (1874). In 1881 he was retired.

RODGERS, Frederick (1842–). An American naval officer, born at Havre de Grace, Md. After graduating from the United States Naval Academy in 1861, he served on the *Wabash*, *Santee*, and *Kineo* during the Civil War and participated in engagements at Donaldsonville, Port Hudson, and College Point, La. He was promoted to commander in 1875; commanded the *Despatch* (1873–76), *Adams* (1877–79), and *Independence* (1883–87); and, becoming captain in 1890, was in command of the *Philadelphia* (1890–92) and the *Massachusetts* (1896–97). Rodgers served as president of the board of inspection and survey in 1897–98 and in 1898–1901, commanded the *Puritan* during the war with Spain in 1898, became commodore (1898), rear admiral (1899), senior

squadron commander (1901) and commander in chief (1902) of the Asiatic Fleet, and thereafter was commandant of the New York Navy Yard until his retirement in 1904.

RODGERS, JOHN (1771–1838). An American naval officer, born in Harford Co., Md. He entered the naval service in 1798 as a lieutenant and was executive officer of the frigate *Constellation* under Captain Truxtun at the time the French frigate *L'Insurgente* was captured off Nevis, Feb. 9, 1799. For his conduct in this action he was promoted to a captaincy. In May, 1803, he commanded the *John Adams* in the Mediterranean. In 1804 he commanded the *Congress* at Tripoli in the squadron under Captain Barron, whom he succeeded in 1805. After peace was declared he sailed to Tunis, where he dictated terms of peace to the Bey. His action while on the *President*, with the British man-of-war *Little Belt* (May 17, 1811), as the result of an attempt on his part to effect the rescue of an impressed American seaman, widened the breach then existing between Great Britain and the United States. In 1812, war having been declared by the United States, Commander Rodgers was placed in command of a squadron consisting of the *President, United States, Congress, Hornet*, and *Argus*, and, meeting the British ship *Belvidera*, chased her, and a running fight followed—the first battle of the war—in which Rodgers was wounded by the bursting of a gun in his vessel, the *President*. On a cruise soon afterward he captured a number of British merchantmen and also the packet *Swallow*, which carried $200,000 in specie. In 1814 he was ordered to the command of the new frigate *Guerrière* and rendered valuable aid in the defense of Baltimore. From 1815 to 1824 he was president of the Board of Naval Commissioners and in 1823 was acting Secretary of the Navy. From 1824 to 1827 he had command of the squadron in the Mediterranean. Consult Barnes, *Naval Actions of the War of 1812* (New York, 1896).

RODGERS, JOHN (1812–82). An American naval officer, son of John Rodgers (1771–1838), born in Harford Co., Md. He entered the navy as a midshipman in 1828 and saw active service in the Seminole War. During the years 1852–55 he commanded government exploring expeditions in the North Pacific and Arctic oceans. At the outbreak of the Civil War he was ordered to the West, where for a time he superintended the building of ironclads. He then joined the Port Royal expedition and on May 15, 1862, commanded the *Galena* in the bombardment of Fort Darling. A few months later he was promoted to be captain, and on June 17, 1863, while commanding the monitor *Weehawken*, he fought and captured the Confederate ironclad *Atlanta*, thus earning the rank of commodore. In 1870 Rodgers was given command of the Asiatic squadron and, while on the coast of Korea, was fired upon by two forts, which he promptly bombarded and captured. From 1877 until his death he was superintendent of the United States Naval Observatory at Washington, and in 1863 he was chosen one of the 50 active members of the National Academy of Sciences.

RODIN, rō'dăN', AUGUSTE (1840–1917). A French sculptor, one of the greatest of all times. He was born in Paris, Nov. 4, 1840, of a poor family. His only general education was at a school in Beauvais, kept by an uncle. When 14 years old he entered the famous Petite Ecole in Paris, a school of decorative art, but failed to gain admission to the Ecole des Beaux-Arts and studied at the school of Barye (q.v.) in the Jardin des Plantes. At 22 he modeled an extraordinary head, called the "Broken Nose," one of the most powerful and characteristic of his works. In 1863 Rodin entered the service of Carrier-Belleuse, art director of the Sèvres manufactory. During the siege of Paris in 1870 he served in the National Guard, and after the war he spent seven years at Brussels engaged in decorative sculpture and in quiet study.

After a short visit to Italy in 1875, he modeled an extraordinary statue, the "Age of Bronze," exhibited in the Salon of 1877. It was received most enthusiastically by the younger sculptors, but condemned by the more conservative on account of its radical naturalism. Before the Exhibition of 1878 Rodin modeled some superb decorative heads for the Trocadéro Palace. This work and a bust of "St. John" (1879, Metropolitan Museum, New York) won for him the patronage and warm friendship of Turquet, Undersecretary of Fine Arts, through whose instrumentality the "Age of Bronze" was placed in the Luxembourg gardens. In 1880 Rodin completed his statue of "St. John Preaching," a powerfully realistic work which was bought for the Luxembourg gallery.

In the same year Turquet secured for him a commission for a bronze door for the Musée des Arts Decoratifs. As originally planned the work was to be 18 feet high and 12 feet wide and covered with figures suggested by Dante's *Inferno*, whence its name, "La porte de l'enfer." It was never completed, but the figures and groups intended for it are among the sculptor's best works. Among them are "The Thinker" (Paris) and "Adam" and "Eve" (Metropolitan Museum, New York). Next in importance among his works is the monument to the six "Bourgeois de Calais," a work for which he received the commission in 1883. In its intense naturalism and dramatic energy this work is the culmination of the genius of Rodin, if not of modern sculpture. Of other ambitious works the monuments to Victor Hugo (1909, Palais Royal Gardens) and Balzac showed great eccentricity together with unquestioned power. The latter was rejected, but the original study for the magnificent head is in the Metropolitan museum. Particularly during his later years he executed a series of small groups of marble, to be seen from all sides, such as "Ugolino," "The Kiss," and the "Danaid" in the Luxembourg; "Pygmalion and Galatea," "Cupid and Psyche," "Orpheus and Eurydice," "The Hand of God," and the "Bather" (1910) in the Metropolitan Museum. He also executed a number of admirable busts of great power, among which are those of Legros, Dalou, Victor Hugo, Puvis de Chavannes, J. P. Laurens, Antonin Proust, Mirbeau, Falquière, Carrier-Belleuse, Becque, and Rochefort. There was a comprehensive exhibition of all his works at the Paris Exhibition of 1900.

Rodin is well represented in many museums, particularly in the Luxembourg, but also at Dresden, Copenhagen, Berlin, South Kensington (London). The Metropolitan Museum, New York, largely through the munificence of Thomas F. Ryan (q.v.), possesses 21 examples besides many studies, drawings, and casts (Rodin himself gave 18 signed plaster casts). Some are replicas of the works mentioned above, but

there are other noteworthy examples, such as the busts of George Wyndham, Madame X, and Edward H. Harriman, the bronze "Martyr" (1914), the "Old Courtesan." The original pieces in this collection were chosen with the advice and approval of the sculptor.

Rodin's art is the culmination of the naturalistic sculpture of the nineteenth century, and yet in knowledge of anatomy and profound mastery of technique he stands with Michelangelo; in pathetic intensity, the chief spiritual characteristic of his art, with Scopas. With equal skill he adapts his technique to all materials, marble as well as bronze, and he excels alike in colossal and in minute sculpture. A marked technical feature of his later statuary is its unfinished or impressionistic character. The figures rise, as it were, from the unfinished block, and he ceases the moment expression has been attained. His spirited drawings and studies in clay are unique of their kind. Rodin also became known as a ceramist of ability, as the designer of excellent dry points, and as a writer whose appreciation of Greek and mediæval art is profound and illuminating. He is the author of *L'Art*, interviews collected by Paul Gsell (1911; Eng. trans., 1912); *Venus* (1912); *Les cathédrales de France* (1914). Rodin became president of the International Society of Painters, Sculptors, and Engravers (London), an officer in other important art societies, and a Grand Officer of the Legion of Honor. He received the degree of D.C.L. from Oxford.

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RODIYAS, rō-dē'yȧz. A degraded and outcast race in Ceylon, regarded by some as a branch of the Veddas (q.v.).

ROD'MAN, Thomas Jefferson (1815–71). An American soldier, born at Salem, Ind. He graduated at West Point in 1841 and from that time until his death was continuously employed at various government arsenals or on ordnance boards, rising to the rank of lieutenant colonel of ordnance and brevet brigadier general in the regular army. He invented the method of cooling gun castings from the inside and the prismatic powder for use in large cannon. The Rodman gun was named after him. He published *Reports of Experiments on the Properties of Metal for Cannon and on Cannon Powder* (1861). See Artillery; Ordnance.

RODMAN, William Louis (1858–1916). An American surgeon. He was born at Frankfort, Ky., graduated in 1879 from Jefferson Medical College, Philadelphia, and for two years served as United States army surgeon. In 1882 he established himself in Louisville, where he was professor of surgery at the Kentucky School of Medicine (1893–98), and afterward held chairs of surgery at the Medico-Chirurgical College and Woman's Medical College, both in Philadelphia. In 1915 he served as president of the American Medical Association. Rodman published *Diseases of the Breast* (1908).

RODMAN GUN. See Artillery; Ordnance.

ROD'NEY, Cæsar (1728–84). An American patriot, born at Dover, Del. From 1755 to 1758 he was high sheriff of Kent County and then became justice of the peace and judge of the lower courts. He was a delegate to the Stamp Act Congress in 1765, was Speaker of the Delaware Assembly from 1769 to 1774, and was chairman of the Delaware Committee of Safety and of the State Convention in 1774. In 1774–76 he was one of Delaware's representatives in the Continental Congress, where he was a strong advocate of independence and was one of the signers of the Declaration. Having in 1775 been made a colonel and later a brigadier general of the State militia, he served under Washington in 1777, becoming a major general of militia in September. From 1778 to 1782 he was President of Delaware.

RODNEY, George Brydges, first Baron Rodney (1719–92). An English admiral. Entering the English navy in 1732 as King's letter boy, he became lieutenant in 1739 and post captain in 1742 and won his first honors through his brilliant participation in Hawke's victory of Oct. 14, 1747, over the French fleet under L'Etenduère. He served under Boscawen in the successful expedition of 1758 against Louisburg and in 1759 was made rear admiral. Having rendered valuable services in the English West Indies in 1761–62, he was in the latter year advanced to the vice admiralty and in 1764 made Baronet. In 1779, at the time of the alliance of Spain with France against England, Rodney, now admiral, received command of the fleet at the Leeward Islands Station, with instructions also to relieve Gibraltar, besieged by the Spanish. After capturing seven Spanish ships of war bound for Cadiz, he fell in, Jan. 16, 1780, with the Spanish admiral Langara, off Cape St. Vincent. Of the Spanish fleet five vessels were captured and two destroyed. Having accomplished the relief of Gibraltar and Minorca, he quitted the Mediterranean and won an indifferent victory, near Martinique, over the French fleet under the Count de Guichen. The victory upon which his fame mainly rests was that won over the French fleet under De Grasse, off Dominica, April 12, 1782. De Grasse was totally defeated and made prisoner. Rodney's victory saved Jamaica and ruined the naval power of France and Spain. Meanwhile in England the North ministry had fallen, and the Rockingham ministry had sent Admiral Pigot to supersede Rodney for political reasons, before news of his great victory had reached London. As a reward for his services he was raised to the peerage as Baron Rodney and given a pension of £2000 per annum for himself and his successors. He lived in retirement for the rest of his life and died May 23, 1792. Consult: G. B. Mundy, *Life and Cor-*

respondence of Admiral Lord Rodney (London, 1830); David Hannay, *Rodney* (ib., 1891); A. T. Mahan, *Types of Naval Heroes* (Boston, 1901).

ROD OF AARON. See DIVINING ROD.

RODOSTO, rō-dŏs′tō. A town in the Vilayet of Adrianople, European Turkey, situated on the north shore of the Sea of Marmora, 78 miles west of Constantinople (Map: Balkan Peninsula, F 4). It is surrounded by beautiful gardens and has many mosques, several Christian churches, and a Greek school. Pop., about 20,000, nearly half of them Greeks. The town was captured by the Bulgarians in the course of the Balkan War (q.v.), but was restored to Turkey by the Treaty of London (May 30, 1913).

RODRIGO. See CIUDAD RODRIGO.

RODRIGUEZ, rō-drē′gĕs. A small volcanic island in the Indian Ocean, about 370 miles east of the British Island of Mauritius (q.v.), of which it is an administrative dependency (Map: World, Eastern Hemisphere, L 27). It covers an area of about 40 square miles and has a good climate and a rich flora. There is a safe harbor on the northern coast. Pop., 1901, 3163; 1911, 4829, chiefly settlers from Mauritius.

RODRIGUEZ, AGUSTIN (1844–). A Mexican lawyer and politician. He was educated in the city of Mexico, receiving the degree of doctor in jurisprudence, and achieved notable success both in the practice and in the teaching of law. As a leader of the Catholic party he took an active part in politics. In 1914 he was one of the Huerta delegates to the conference at Niagara Falls called to consider the relations of Mexico and the United States.

RODRÍGUEZ DE FONSECA, rō-drē′gāth dā fōn-sā′kä, JUAN (1451–1524). A Spanish prelate, born at Toro. He became Archdeacon of Seville; Bishop successively of Badajoz, Cordova, Palencia, and Burgos; Archbishop of Rossano, Italy; and principal chaplain to Isabella and later to King Ferdinand. He was appointed head of the Department of Affairs in the Indies, organized by the sovereigns in 1493, with headquarters at Seville. Although possessed of some administrative ability, he was jealous of Columbus, and when, during the preparations for the Admiral's second voyage, a quarrel arose between them and he was instructed to obey Columbus, his jealousy increased to absolute hatred. It was through him also that Francisco de Bobadilla (q.v.) was sent out to make investigations at Hispaniola. He afterward hampered Cortés and Las Casas in similar fashion. He was extremely cruel in his attitude towards the Indians.

RODRÍGUEZ DE MONTALVO, GARCÍ. See ORDÓNEZ DE MONTALVO, GARCÍ.

ROD′WELL, JOHN MEDOWS (1808–1900). An English Orientalist, born at Barham Hall, Suffolk, and educated at Bury St. Edmunds and at Gonville and Caius College, Cambridge. He took holy orders in 1832 and for 57 years (1843–1900) was rector of St. Ethelburga's, Bishopsgate. Rodwell was an accomplished Hebrew and Arabic scholar and translated the Koran (1861; 2d ed., 1876), the Book of Job (1864; 2d ed., 1868), and Isaiah (1881; 2d ed., 1886), as well as liturgies from the Coptic (1866) and from Ethiopic manuscripts (1864).

ROE, EDWARD PAYSON (1838–88). An American clergyman and novelist, born in Moodna, Orange Co., N. Y. Illness caused him to leave Williams College before graduation, but he afterward received a bachelor's degree, studied at Auburn and Union Seminaries, and in 1862–65 was a chaplain in the volunteer service. He was from then until 1874 pastor of the Presbyterian Church at Highland Falls, N. Y., after which he gave himself up to lecturing, writing, and fruit culture. His first novel, *Barriers Burned Away* (1872), a story suggested by the Chicago fire, was followed by *Play and Profit in my Garden* (1873) and many novels, all very popular in the United States, many of them reprinted in England, and some translated into German. Of these the chief are *What Can she Do?* (1873), *Opening of a Chestnut Burr* (1874), *From Jest to Earnest* (1875), *Near to Nature's Heart* (1876), *A Knight of the Nineteenth Century* (1877), *A Face Illumined* (1878), *A Day of Fate* (1880), *His Sombre Rivals* (1883), *A Young Girl's Wooing* (1884), *An Original Belle* (1885), *Driven Back to Eden* (1885), *He Fell in Love with his Wife* (1886), *The Earth Trembled* (1887). He wrote also *Success with Small Fruits* (1880) and *Nature's Serial Story* (1884). Consult *E. P. Roe, Reminiscences of his Life,* by his sister, Mary A. Roe (New York, 1899).

ROE, FRANCIS ASBURY (1823–1901). An American naval officer, born in New York City. He graduated at the Naval Academy in 1848, in 1849 was dismissed from the service for disobedience, but was reinstated in 1850 and saw his first active service in 1854 against Chinese pirates. As executive officer, he was on the *Pensacola* in its run down the Potomac in 1861. In 1862–63 he commanded the *Katahdin* on the Mississippi and repulsed the attack of Gen. John C. Breckinridge on Baton Rouge. In 1864, commanding the *Sassacus,* Roe fought a sharp duel with the *Albemarle* and forced its retreat. Towards the close of the Civil War he was on duty in the Great Lakes. He was sent on a special mission to Mexico in 1867 and showed himself an able diplomat. He became rear admiral in 1884 and retired in 1885. Consult Benjamin, *Francis Asbury Roe* (Washington, 1904).

ROE, JOHN ORLANDO (1849–1915). An American laryngologist, born at Patchogue, L. I. He graduated in pharmacy and medicine from the University of Michigan (1870), received the degree of M.D. also from the College of Physicians and Surgeons, New York (1871), studied abroad under Sir Morell Mackenzie (q.v.) and others, and established himself in practice in Rochester, N. Y., as a specialist in laryngology, rhinology, and otology. He served as president of the American Laryngological Society (1898), was a member of several international medical congresses, and became corresponding member of foreign societies. Roe did much research work, performed several original operations, and contributed largely to medical literature.

ROE, RICHARD. See DOE, JOHN.

ROE, SIR THOMAS (c.1581–1644). An English diplomat, born at Low Leyton, Essex, and educated at Magdalen College, Oxford. He studied in France besides and lived at court in Elizabeth's last years. In 1610, five years after he was knighted, Henry, Prince of Wales, son of James I, fitted him out for a voyage of discovery. Roe sailed up the Amazon and along the coast to the Orinoco and made two more voyages in the "Indies," searching for gold.

King James in 1614 gave the East India Company permission to send him as Ambassador to the Mogul, Emperor of Hindustan. He obtained new privileges for English merchants and their factories, especially at Surat, which latter acquisition was the basis of the future position of Bombay and largely of British supremacy in India. His successful negotiations are described in his *Journal*, published in 1625. In 1621 he was sent to Constantinople in the interest of English trade and then described the Ottoman Empire as "irrecoverably sick." His mission was successful, as was one undertaken in 1629 to mediate between Sweden and Poland and another in 1638–41 at the Diet of Ratisbon. The Alexandrian manuscript of the Greek Bible, now in the British Museum, and an Oriental collection presented to the Bodleian Library were brought to England by him.

ROEBLING, rō′blĭng, JOHN AUGUSTUS (1806–69). An American engineer. He was born at Mühlhausen, Prussia, and studied civil engineering at the Polytechnique School of Berlin. In 1831 he came to America and settled near Pittsburgh. He was made assistant engineer on the slack-water navigation of the Beaver River. After similar engagements in other places he was appointed to survey the route across the Alleghanies adopted by the Pennsylvania Railroad. He then began the manufacture of wire rope and in 1844–45 replaced the wooden aqueduct of the Pennsylvania Canal across the Allegheny River by a suspension aqueduct. Afterward he constructed the Monongahela suspension bridge at Pittsburgh and from 1848 to 1850 four suspension aqueducts on the Delaware and Hudson Canal. He established his works at Trenton, N. J., and in 1852 began the great suspension bridge over the Niagara River. In 1867 he began the Cincinnati suspension bridge, which has a clear span of 1057 feet. His last enterprise was the Brooklyn Bridge, the first great bridge across the East River between Brooklyn and New York. The designs were completed, but the work had not been begun on the bridge when Mr. Roebling died from an injury. His son, Washington Roebling (q.v.), carried on the work. He published *Long and Short Span Bridges* (1869). See BRIDGE, *Suspension Bridges.*

ROEBLING, WASHINGTON AUGUSTUS (1837–). An American civil engineer, son of John A. Roebling. He was born at Saxonburg, near Pittsburgh, Pa., graduated at Rensselaer Polytechnic Institute, Troy, in 1857, and worked under his father on the Allegheny suspension bridge at Pittsburgh. At the beginning of the Civil War he entered the Federal army as a private in the Sixth New York Artillery. Save for the first year of his enlistment he was on staff duty. After the evacuation of Yorktown he built a 1200-foot suspension bridge across the Rappahannock. In the second Bull Run campaign he built a bridge at Harper's Ferry across the Shenandoah River. While reconnoitring from a balloon he is said to have first discovered Lee's movement from Fredericksburg towards Pennsylvania. On retiring from the army he undertook the completion of the Cincinnati and Covington Bridge. Having spent some time in Europe studying pneumatic foundations, in 1869 he succeeded his father in complete charge of the construction of the first great bridge between New York and Brooklyn, known as the Brooklyn Bridge. (See BRIDGE, *Suspension Bridges.*) He considerably changed his father's plans, especially by increasing the size of the anchor plates. His devotion to the work, and especially his almost continuous stay in the compressed-air caissons, proved too much for an already weakened constitution, and from 1873 to the completion of the bridge in 1883 he had to direct the work from his sick room. After 1883 he settled in Trenton, as head of the wire business established by his father. He published the pamphlet *Description of a New Method of Transmitting Power by Means of Wire Ropes* (1869; 6th ed., 1881).

ROEBUCK, JOHN ARTHUR (1802–79). A British politician. He was born at Madras, India, and passed his youth, from 1815 to 1824, in Canada, where he was educated. In 1824 he went to England, studied law, and was called to the bar at the Inner Temple in 1831. He was returned to Parliament for Bath in 1832 and again in 1835 and represented Sheffield in that body from 1849 to 1868 and from 1874 until his death. In 1835, when the executive government of Canada and the House of Assembly of Lower Canada were at variance, the latter body appointed Roebuck their paid agent in England—a position which involved him in a serious quarrel with the press. In 1855 he brought about the fall of Lord Aberdeen's ministry on the charge of mismanagement in the prosecution of the Crimean War. He warmly supported the Earl of Beaconsfield's policy during the Eastern crisis in 1877–78 and in 1878 was made a member of the Privy Council. He wrote *The Colonies of England* (1849); *The History of the Whig Ministry of 1830* (2 vols., 1832); and an autobiography which is published in *Life and Letters of John Arthur Roebuck* (ed. by R. E. Leader, New York, 1897).

ROE DEER (AS. *rāhdēor*, from *rāh*, OHG. *rēh*, Ger. *reh*, Eng. *roe* + AS. *deor*, Eng. *deer;* connected with Skt. *rekha*, *lēkha*, line, *rikh*, *likh*, to write, scratch). A European deer (*Capreolus capreolus*), once plentiful throughout wooded regions as far east as Persia and still to be found wild in thinly settled countries. The buck stands about 26 inches high, weighs about 60 pounds, and is tawny brown in summer, more dull and grizzled in winter, the lower parts and around the tail white; the tail is very short. The antlers of the buck are 8 or 9 inches long, erect, round, very rough, and have two sharp tines (but no brow tine). The roe is not gregarious, and pairs are said to remain attached during life. The voice resembles that of sheep, but is shorter and more barking. Another species of roe (*Capreolus pygargus*), rather larger than the common roe, is found in Tatary, and a third in Manchuria. Consult Richard Lydekker, *Deer of All Lands* (London, 1898), and F. G. Aflalo, *Sport in Europe* (New York, 1901).

ROE DEER.

ROEDERER, rē′de-râr′, PIERRE LOUIS, COUNT

(1754–1835). A French administrator and historian, born at Metz. He was elected to the Third Estate in 1789 and soon became well known as an administrative reformer. He became professor of economics at the Ecole Centrale, enjoyed Napoleon's favor, and in 1806 was appointed Minister of Finance in the Kingdom of Naples. Further advance was hindered by his opposition to the continental blockade. Roederer sided with Napoleon in the Hundred Days and took no prominent part in politics after the Second Restoration, although he sat in the House of Peers in 1815 and after the revolution of July, 1830. He wrote: *Louis XII* (1820); *François I* (1825); *Mémoire pour servir à l'histoire de la société polie en France* (1835). His complete works were edited by his son, but printed in a very small edition for the family only (Paris, 1853–59).

ROEDIGER, rē'dī-gĕr, EMIL (1801–74). A German Orientalist. He was born at Sangerhausen and studied philology and theology at Halle where he rose to be professor of Oriental languages (1835). From 1860 till his death he held a chair at Berlin. Besides numerous papers on paleography and various Oriental topics his chief writings comprise: *De Origine et Indole Arabicæ Librorum Veteris Testamenti Historicorum Interpretationis Libri Duo* (1829); an edition of Lokman's Fables (1830; 2d ed., 1839); *Chrestomathia Syriaca* (1838; 3d ed., by his son, 1892); *Versuch über die himjaritischen Schriftmonumente* (1841); *Wellsteds Reisen in Arabien, deutsche Bearbeitung* (1842). He also finished Gesenius' *Thesaurus Linguæ Hebraicæ.*

ROELAS, rô-ā'lâs, JUAN DE LAS (called EL CLÉRIGO, i.e., The Cleric) (c.1558–1625). A Spanish religious painter, born at Seville, of a noble family. His first important painting, "The Death of San Hermenegildo" (Hospital of the Cardinal, Seville), shows the influence of Cespedes, Pacheco, and Herrera, but he was also a faithful student of nature, and later during a probable sojourn in Venice he was much influenced by the works of Titian and of Tintoretto. In harmonious brilliancy of color and striking contrasts of light and shadow he is a worthy rival of these great Venetians. He was also a skillful draftsman and possessed dramatic power. But although one of the chief masters of Andalusia, Roelas' works were little known out of Spain until the nineteenth century. The finest of them are at Seville, notably his masterpiece, "The Transit of St. Isidore," in the church of San Isidoro; "St. James in the Battle of Clavigo" (1609), in the cathedral; and "The Martyrdom of St. Andrew," in the Museum. The Berlin Museum contains a fine "Immaculate Conception" by him. Roelas lived chiefly in Seville and died in Olivares, where he was canon of the Collegiate Church.

ROELOFS, rōō'lōfs, WILLEM (1822–97). A Dutch painter, etcher, and naturalist. He was born at Amsterdam, studied at The Hague under Hendrik van de Sande-Bakhuyzen (1795–1860), and during a sojourn in France was much influenced by the painters of Barbizon, particularly Rousseau. Roelofs was the pioneer of the modern Dutch school of emotional landscape and the first to direct his compatriots back to the study of nature. He lived for 40 years in Brussels, but made frequent trips to Holland, choosing the subjects for his paintings, in both oil and water colors, most frequently from the less-known regions of his country. The Rijks-Museum, Amsterdam, contains a "View near The Hague"; the Municipal Museum, Amsterdam, "The Gein"; the Brussels Museum two landscapes; the Rotterdam Museum a "Landscape with Cattle"; and the Liége Museum a "Forest in Autumn." Roelofs was also favorably known for his researches in entomology.

ROEMER, rē'mĕr, FRIEDRICH ADOLF (1809–69). A German geologist, born in Hildesheim and educated at Göttingen and Berlin. In 1845 he became instructor in mineralogy and geology at the Klausthal School of Mines, of which he was superintendent from 1862 to 1867, when he retired. He was a pioneer in pointing the relation between Jurassic and Cretaceous formations in Germany with those in the rest of Europe and an authority on the mountains of northern Germany. His works include: *Die Versteinerungen des norddeutschen Oolithengebirges* (1835–39); *Die Versteinerungen des norddeutschen Kreidegebirges* (1840–41); *Beiträge zur geologischen Kenntnis des nordwestlichen Harzgebirges* (1850–66).

ROEMER, OLAUS. See RÖMER, OLAUS.

ROENTGEN, rēnt'gen, WILHELM KONRAD. See RÖNTGEN, WILHELM KONRAD.

ROERMOND, rōōr'mônt. A town in the Province of Limburg in the Netherlands, situated at the confluence of the Roer with the Meuse, 28 miles northeast of Maastricht (Map: Netherlands, E 3). It contains a thirteenth-century Romanesque cathedral, a seminary, and a fine palace of justice. The manufactures of the town consist of woolens, cotton goods, paper, stone and wood carvings. Pop., 1913, 12,957.

ROESKILDE. See ROSKILDE.

ROGA'TION DAYS (Lat. *rogatio*, supplication, from *rogare*, to ask). The Monday, Tuesday, and Wednesday before Ascension Day, so called because on these days the litanies (q.v.) are appointed to be sung or recited by the clergy and people in public procession. The practice of public supplications on occasions of public danger or calamity is traceable very early in Christian use, but the fixing of the days before Ascension for the purpose is ascribed to Mamertus, Bishop of Vienne, in the middle of the fifth century. The form of prayer employed is that known as the Litany of the Saints. In England, after the Reformation, the recitation of the litanies upon these days was discontinued, but the days remain as days of abstinence and prayer to obtain God's blessing upon the fruits of the earth; they form also a brief preparation, somewhat analogous to Advent and Lent, before the great festival of the Ascension. In the Catholic church the days before Ascension are called minor rogation, and April 25 is major rogation. For the popular customs in England, consult Chambers, *Book of Days*, vol. i (new ed., Philadelphia, 1911).

ROGER (rŏj'ĕr) **I** (ROGER GUISCARD) (c.1031–1101). Grand Count of Sicily, founder of Norman rule in that island. He was the youngest of the sons of the Norman noble Tancred de Hauteville (q.v.). In 1058, in answer to the summons of his brother, Robert Guiscard (q.v.), he went to Italy. On his arrival he was deputed by Robert to conquer Calabria, an achievement which was speedily executed. In 1061 he set out on an expedition against Sicily, then ruled by a number of Saracen chiefs, and by 1090 he had taken

the most important towns and ousted the Saracens from the control of the island. In 1062 he was invested by his brother with part of Calabria under the title of Count, and in 1072 with most of Sicily. Roger divided the country into fiefs, which he distributed among his chief barons. Moreover, he extended his own rule in Calabria. About 1096 he took the title of Grand Count, to distinguish him from his vassals. He supported Rome against the Greek church, and in 1098 Pope Urban II, in recompense for his fidelity to the holy see, conferred the title of Papal Legate upon him and his heirs forever. He died at Mileto in Calabria in July, 1101. Consult E. L. E. Caspar, *Roger II* (Innsbruck, 1904), and Ferdinand Chalandon, *Histoire de la domination normande en Italie et en Sicile* (2 vols., Paris, 1907).

ROGER II (c.1093–1154). Grand Count of Sicily from 1101 to 1130 and King of Sicily from 1130 to 1154. He was a son of Roger I (q.v.). Upon the death of his brother Simon he became the heir to Sicily, and during his minority the government was administered by his mother. He compelled his cousin William to yield up the portion of Calabria and of the town of Palermo which Robert Guiscard had withheld from his father, and after the death of William (1127) he took possession of Apulia itself. Ambitious of the title of King, he supported the antipope Anacletus, his wife's uncle, and received from him the title of King of Sicily, with right of suzerainty over the duchies of Naples and Capua. In return Roger established Anacletus on the pontifical throne in 1130. In 1144 Roger received from Pope Lucius II the right of using the various symbols of ecclesiastical dignity and power. In 1147 he began war on the Byzantine Emperor, Manuel Comnenus, who had been in the league with the Pope and the Emperor against him. Corfu was captured and Cephalonia, Negropont, Corinth, and Athens were pillaged. He followed up these successes by the capture of Tripoli and other places on the African coast, and afterward attacked the Zeirides, leaving at his death an African dependency which stretched from Morocco to Kairwan. His daughter Constantia married in 1186 the Emperor Henry VI, whereby the Hohenstaufen succeeded in 1194 to the rule of the Two Sicilies. Consult: E. L. E. Caspar, *Roger II* (Innsbruck, 1904); Ferdinand Chalandon, *Histoire de la domination normande en Italie et en Sicile* (2 vols., Paris, 1907); Edmund Curtis, *Roger of Sicily* (New York, 1912).

ROGER OF HOWDEN, or HOVEDEN. See HOVEDEN, ROGER OF.

ROGER OF WEN'DOVER (?–1236). An English chronicler, monk of St. Albans and for a time prior at Belvoir. He wrote the *Flores Historiarum,* a work based upon a chronicle by John de Cella to 1188, but original from 1189 to 1235. The work was edited by Coxe, for the English Historical Society (1841–49), and in part by Hewlett in the *Rolls Series* (1886–89).

ROGERS, rŏj'ĕrz. A town in Benton Co., Ark., 90 miles north of Fort Smith, on the St. Louis and San Francisco and the Kansas City and Memphis railroads (Map: Arkansas, A 1). It has a vinegar and preserving plant, large flour mills, white-lime works, and a hub and spoke factory. Pop., 1900, 2158; 1910, 2820.

ROGERS, FAIRMAN (1833–1900). An American civil engineer, born in Philadelphia. He graduated at the University of Pennsylvania in 1853, and from 1855 to 1871 was professor of civil engineering therein. Rogers served in the Civil War. He was one of the charter members of the National Academy of Sciences. He wrote *Terrestrial Magnetism and the Magnetism of Iron Ships* (1877; rev., 1883).

ROGERS, HENRY DARWIN (1806–66). An American geologist, born in Philadelphia. He studied at William and Mary College, in 1830–31 was professor of chemistry and natural philosophy at Dickinson College, and then studied science for two years in London, England. After his return he lectured at Franklin Institute in Philadelphia, and in 1835 became professor of geology at the University of Pennsylvania. The same year he made for the government of New Jersey a geological and mineralogical survey of that State, publishing a full report in 1840. From 1836 to 1842, and again from 1851 to 1854, he was State geologist of Pennsylvania. In 1855 he removed to Edinburgh, Scotland, where the final report of his geological works was published under the title *The Geology of Pennsylvania: A Government Survey* (2 vols., 1858). From 1857 until his death he was regius professor of natural history in the University of Glasgow.

ROGERS, HENRY HUTTLESTONE (1840–1909). An American capitalist, born at Fairhaven, Mass., and educated in the Fairhaven High School. After being newsboy, clerk, and railroad workman, he went to Pennsylvania in 1860 and settled at McClintock's Wells. Here he entered the oil business, in which his success was extraordinary; he was one of the first men in the kerosene industry. In 1870 he went to New York to enter the employ of Charles Pratt. His interests and holdings increased and in 1874 he became a factor in the organization of the Standard Oil Company. He finally became vice president of this corporation and chief lieutenant of John D. Rockefeller, and was generally credited with being the executive head of the company. Accumulating a vast fortune, he invested heavily in other businesses, becoming president of the Amalgamated Copper Company in 1901, director in the United States Steel Corporation, the National Transit Company, and numerous other railway, mining, insurance, banking, and industrial enterprises. In 1907 Rogers completed the building of the Tidewater Railroad, 442 miles in length, entirely with his own capital. In business he believed in and practiced ruthless efficiency, and his methods of competition and consolidation were sharply criticized as being illegal and against the public welfare. His establishment and conduct of the Brookline Gas Company at Boston were regarded by some as an example of the "frenzied finance" that fails to respect the interests of the people. Rogers left a fortune estimated at over $100,000,000. His benefactions to his native town amounted to more than $3,000,000.

ROGERS, HENRY WADE (1853–). An American jurist and educator, born at Holland Patent, N. Y. He was educated at the University of Michigan (A.B., 1874; A.M., 1877). After one year in the law school of the university, he studied privately under Prof. Thos. M. Cooley (q.v.), and was admitted to the bar in 1877. He succeeded ex-Senator Felch as Tappan professor of law at the University

of Michigan in 1883, was Cooley's successor as dean (1885–90), and thereafter till 1900 was president of Northwestern University. During his administration the law school of the university was greatly developed and the general enrollment more than doubled. In the Yale Law School he served as lecturer (1900–01), professor (1901–13), and dean (1903–13). In 1913 he was appointed United States Circuit Judge by President Wilson, whose candidacy he had supported in 1912. Rogers was prominently identified with the work of the Methodist church and in movements for federation of Protestant churches, uniformity of laws, advancement of legal education, prison reform, and peace. He also took an active part in Democratic politics in Connecticut. Rogers published: *Illinois Citations* (1881); *Expert Testimony* (1883); *Introduction to Constitutional History as Seen in American Law* (1889); and he was joint author of *Two Centuries of American Law* (1901).

ROGERS, James Edwin Thorold (1823–90). An English political economist, born at West Meon, Hampshire. He was educated at King's College, London, and at Magdalen Hall, Oxford, where he graduated in 1846. He was ordained soon after his graduation, and took part in the High Church movement. In 1859 he was elected Tooke professor of statistics and economic science at King's College, and in 1862 was chosen Drummond professor of political economy at Oxford, but failed of reëlection to that position in 1868. He then entered politics, and represented Southwark in Parliament from 1880 to 1885. In 1888 he was reëlected professor at Oxford. His researches have furnished a vast amount of material for later writers. In his theoretical work he was a close follower of the laissez-faire school of classical economists. His principal works are: *Six Centuries of Work and Wages* (1885); *History of Agriculture and Prices in England* (1866, 1887); *First Nine Years of the Bank of England* (1887); *The Economic Interpretation of History* (1888); *The Industrial and Commercial History of England* (published posthumously, 1892).

ROGERS, John (c.1500–55). An English martyr, born at Deritend, near Birmingham, and educated at Cambridge. After being ordained he was rector of Holy Trinity, London (1532–34), and chaplain to the English merchants at Antwerp (1534–36), where he met William Tyndale and renounced the Roman Catholic faith. In 1537 he became pastor of a Protestant church at Wittenberg. On the accession of Edward VI he returned to England by invitation of Bishop Ridley and became rector of St. Margaret Moyses and St. Sepulchre, in London, in 1550; in 1551 he was made prebendary of St. Pancras, St. Paul's, and rector of Chigwell, and in 1553 divinity reader. On the Sunday after the entrance of Queen Mary into London in 1553 he preached at St. Paul's Cross, denounced popery, and urged upon the people a steadfast adherence to the doctrines taught in King Edward's time. In January, 1555, he was tried before Gardiner, Bishop of Winchester, and on January 29 was condemned to be burned at Smithfield, London. The sentence was carried out on Monday, February 4. Rogers was the first martyr under Mary's reign. He compiled the first authorized English Bible, prepared from Tyndale's manuscript and Coverdale's translation, which was published under the name of Thomas Matthew. (See Bible, *Versions.*) It was printed at Antwerp by Jacob van Meteren. Copies of it in sheets were imported by Richard Grafton and sold in London, 1537 (latest ed., 1551). In Fox's *Martyrology* are found an account of his examinations written while in prison and other papers. Consult the *Life* by J. L. Chester (London, 1861).

ROGERS, John (1829–1904). An American sculptor. He was born in Salem, Mass., and began life as a machinist and draftsman. After an artistic training at Rome and Paris (1858–59) he exhibited upon his return to the United States the "Slave Auction" (1860), which first brought him into prominence, and in 1860–65 he executed a series of war statuette groups in gray clay, among which were the "Picket Guard," "One More Shot," and "Union Refugees." His genre groups and statuettes modeled in green clay and often reproduced in bronze are mechanical in execution and, though very popular, cannot be classed as serious works of art. Among the best known are "Coming to the Parson" (1870), the "Charity Patient," "Going for the Cows" (1873), "The Town Pump." The groups "The Slave's Story" and "Council of War" contain portrait studies of such well-known men as Beecher, Whittier, Lincoln, Grant, and Stanton. Other statuette groups illustrate passages from Shakespeare, Irving's *Rip Van Winkle,* with portrait of Joseph Jefferson, and Longfellow's *Miles Standish* ("John Alden and Priscilla"). His more ambitious efforts include the equestrian statue in bronze of General Reynolds (1881–83) in front of the city hall, Philadelphia, and a bronze group of "Ichabod Crane and the Headless Horseman" (1887). A number of the Rogers groups in bronze are in the Metropolitan Museum, New York. He was elected to the National Academy in 1863, and at the Chicago Exposition in 1893 he received a gold medal for his "Lincoln."

ROGERS, Randolph (1825–92). An American sculptor. He was born at Waterloo, N. Y., but was early resident in Ann Arbor, Mich. In 1848 he went to Rome and studied with the sculptor Lorenzo Bartolini for two years. In 1855, after spending some time in New York, he went again to Italy, settling in Rome. He was elected to the Academy of St. Luke, succeeding Crawford after the latter's death. Although Rogers was extremely popular in his day, his large output, with few exceptions, now seems devoid of originality and lacking in skillful workmanship. Among his ideal figures are the well-known "Nydia" (Art Institute, Chicago); "Lost Pleiad"; "Ruth" (Metropolitan Museum of Art); "Isaac," "A Boy with Dog," and the "Angel of the Resurrection" (1862), for the Colt monument at Hartford, Conn. Among his notable public works may be mentioned a statue of John Adams (1857) in Mount Auburn Cemetery, Cambridge, Mass.; the bronze doors of the capitol extension in Washington (1858), the bas-reliefs of which represent the principal events of the career of Columbus; figures of Marshall, Mason, and Nelson for the Washington monument at Richmond, Va. (1861), which was left unfinished by Crawford at his death; a colossal bronze statue of Lincoln for Philadelphia (1871); the "Genius of Connecticut" for the State capitol in Hartford; and a statue of W. H. Seward in New York (1876). Rogers was also extensively employed on a series of colossal memorial monu-

ments for various American cities, as at Providence, R. I. (1871), Detroit, Mich. (1873), and Worcester, Mass. (1874). He presented a complete collection of casts of his work to the University of Michigan.

ROGERS, Robert (1731–95). An American soldier, one of the best-known figures in the history of American border warfare. He was born, of Irish parentage, either at Londonderry, N. H., or Methuen, Mass. In 1755, at the outbreak of the French and Indian War, he was commissioned captain of a company of rangers, which, under the name Rogers's Rangers, soon became widely known. During the year 1756, with Fort William Henry as his base of operations, Rogers made 13 daring raids into the country about Ticonderoga. In a scouting expedition to the north of Ticonderoga in January, 1757, his band was almost annihilated by a greatly superior force of Indians and Canadians. Later Rogers accompanied Lord Loudon on his abortive Louisburg expedition, and in March, 1758, he defeated a much larger force of the enemy near Ticonderoga. In August he repulsed an attack of the French under Marin near old Fort Anne. He took part in Wolfe's Quebec expedition, and later, near the mouth of the Saint Francis River, destroyed a village of the Abenaki Indians who had long been the scourge of the New England frontier, though his own force was almost annihilated before he got back to the English outposts. In 1760 he was with Amherst at the capture of Montreal, and late in the year was sent to Detroit, which capitulated to him. In 1761 he was in command of an independent company in the Cherokee country. In 1763, during Pontiac's rebellion, he was in the expedition sent for the relief of Detroit. In 1765 he was in England, where he published his *Journal* and also his more popular *Account of North America.* In 1766 he was made commander of the post of Michilimackinac, but two years later was sent in irons to Montreal on a charge of conspiring to turn the fort over to the French. He was acquitted by court-martial, however, and from 1766 to 1775 he was much of the time in England. At the outbreak of the Revolutionary War he was suspected by the Patriots of being a Tory, was arrested in Philadelphia in 1775, and was turned over on parole to the New Hampshire authorities by order of Congress, but escaped to New York, where he was given a colonel's commission by Lord Howe and recruited the Loyalist regiment known as the Queen's Rangers. He resigned, however, and went to England in the winter of 1776–77, but returned to America towards the end of the war, and for a time commanded a second Loyalist regiment, which he recruited in Canada. He was back in England again in 1784, and died in London, May 18, 1795. His *Journal* (1765) contains valuable details of the French and Indian War. *A Concise Account of North America* (1765), intended to be a popular account of frontier life, particularly of the Indians, is a curious compound of fact and fiction. Rogers is also credited with the authorship of a tragedy entitled *Ponteach; or the Savages of North America,* and the fullest account of his life is by Allan Nevins in an edition of this play published in Chicago in 1914.

ROGERS, Robert (1864–). A Canadian statesman. He was born at Lakefield, Quebec, and was educated at the Lachute Academy and in Montreal. He went to the Canadian Northwest in 1881 and became a successful merchant and promoter of various industrial enterprises. Entering politics as a Conservative, he was elected president of the Manitoba Conservative Convention in 1891 and was an unsuccessful candidate for the House of Commons in 1896. During the period that he was a member of the Manitoba Legislature (1899–1911) he served also as Minister of Public Works in the cabinet of Sir R. P. Roblin (1900–11) and in 1910 was acting Premier of Manitoba. After the defeat of the Laurier administration in 1911, he became in that year Minister of the Interior in the Dominion cabinet of R. L. Borden, was elected to the House of Commons for Winnipeg, and became Minister of Public Works in 1912.

ROGERS, Robert William (1864–). An American Orientalist, born in Philadelphia. He studied at the University of Pennsylvania, at Johns Hopkins, where he graduated in 1887, and at Leipzig and Berlin. He was professor of English Bible and Semitic history at Dickinson College in 1890–92, and in the following year was appointed to a chair of Hebrew and exegesis in Drew Theological Seminary. His publications include: *Two Texts of Esarhaddon* (1889); *Inscriptions of Sennacherib* (1893); *Outlines of the History of Early Babylonia* (1895); *A History of Babylonia and Assyria* (2 vols., 1900; 6th ed., rev., 1915); *The Religion of Babylonia and Assyria* (1908); *Cuneiform Parallels to the Old Testament* (1912); *The Recovery of the Ancient Orient* (1912).

ROGERS, Samuel (1763–1855). An English poet. He was born at Stoke Newington, London. His taste for literature and the company of literary men awoke at an early period, when he familiarized himself with Johnson, Goldsmith, and Gray. In 1786 he published anonymously his first book, entitled *An Ode to Superstition, with Some Other Poems,* followed in 1792 by *Pleasures of Memory*—the work on which his fame most securely rests. In 1803 he retired from active business on an income of £5000 a year, and built and adorned a house in St. James's Place overlooking the Green Park, where he entertained many of the literary men of the time. He was a connoisseur of art, and himself made a collection. His breakfasts became famous. After settling here he published *Columbus* (1810; privately, 1808), a theme too large for him. In 1814 *Jacqueline* appeared in the same volume with Byron's *Lara.* In 1819 he issued *Human Life,* one of his best poems, and, in 1822, *Italy.* To this last poem a second part was added (1828). After this date Rogers wrote little, his time being mainly devoted to dining, epigram, and anecdote. In 1850 the laureateship was offered to him, but declined. He died Dec. 18, 1855. No name occurs oftener than his in the literary annals of the time. Possessed of a large fortune, he befriended his poorer brethren; he obtained a pension for Cary and a position for Wordsworth, and healed the quarrel between Moore and Byron. The high place given him as a poet by his contemporaries he has not been able to maintain. Consult: Alexander Dyce, *Recollections of the Table-Talk of Rogers* (London, 1860); P. W. Clayden, *The Early Life of Rogers* (ib., 1887); id., *Rogers and his Contemporaries* (ib., 1889); R. E. Roberts, *Samuel Rogers and his Circle* (ib., 1910).

ROGERS, WILLIAM (1819–96). An English educational reformer, born in London. He graduated M.A. at Balliol College, Oxford, in 1844, and studied theology at Durham University. While curate of St. Thomas Charterhouse parish (for 18 years) he built up a network of schools for the poor. He became chaplain in ordinary to the Queen (1857), member of a royal commission to inquire into popular education (1858), prebendary of St. Paul's (1862), and rector of St. Botolph, Bishopsgate (1863). A thorough believer in secular education, he earned the nickname of "Hang-theology" Rogers by a chance remark. His work culminated in the opening of Bishopsgate Institute in 1894.

ROGERS, WILLIAM AUGUSTUS (1832–98). An American astronomer and physicist, born in Waterford, Conn. He graduated at Brown University in 1857, became instructor, and in 1858 professor, of mathematics at Alfred Academy (New York State), where from 1866 to 1870 he was head of the department of industrial mechanics. He then became assistant in the Harvard Observatory. There he mapped a part of the skies north of the zenith and contributed to the *Annals* of the observatory. In 1886 he became professor of physics and chemistry at Colby University (later Colby College). Rogers's most important work was in metrology, and included the construction of a dividing engine of high precision and of standards of length. He published *Obscure Heat as an Agent in Producing Expansion in Metals under Air Contact* (1894).

ROGERS, WILLIAM BARTON (1804–82). An American scientist and educator, born in Philadelphia. He graduated in 1822 from William and Mary College, where he accepted the chair of natural philosophy and mathematics made vacant by his father's death (1828). While professor of natural philosophy in the University of Virginia (1835–53) he became head of the State Geological Survey. *Papers on the Geology of Virginia* (1884) give the results of minute researches, in which he was assisted by his three brothers. Rogers's work in this field was scrupulously scientific in method. In 1853 he removed to Boston, where he reformed the system of inspection of gas meters. In 1860 he drew up a scheme for a technical school, in 1862 he received a charter, and in 1865, after a year in Europe to study apparatus, he saw the establishment of the Massachusetts Institute of Technology (q.v.). Of this he was president as well as professor of physics and geology until his resignation in 1881, except for an interim of several years. Rogers introduced laboratory instruction in physics, chemistry, mechanics, and mining. He served as president of the American Association for the Advancement of Science (1848, 1876) and of the National Academy of Sciences (1879). Rogers wrote, besides many papers, *Strength of Materials* (1838) and *Elements of Mechanical Philosophy* (1852). Consult his *Life and Letters*, edited by his wife and William T. Sedgwick (Boston, 1897).

ROGET, rô'zhâ', PETER MARK (1779–1869). An English physician and scholar, born in London. He studied medicine at the University of Edinburgh and removed to Manchester, where he became physician to the lunatic asylum, the fever hospital, and the infirmary. He settled in London in 1808 and was long the secretary of the Royal Society. Among his works are *Animal and Vegetable Physiology* (1834) and a *Thesaurus of English Words and Phrases* (1852), which passed through 28 editions in the author's lifetime, was edited by his son in 1879, and became a standard work of reference (rev. ed., 1914).

ROGIER, rô'zhyâ', CHARLES LATOUR (1800–85). A Belgian statesman, born at Saint-Quentin, France. He studied law at Liége and was admitted to the bar, devoting himself, however, with greater zeal to journalistic campaigns against the Dutch rule in Belgium. Upon the outbreak of the insurrection at Brussels in August, 1830, Rogier went to Brussels, where he gained note as one of the most active among the patriot leaders. He became a member of the provisional government established in October, and after the election of Leopold (q.v.) as King, in June, 1831, was made Governor of Antwerp. He left this post in October, 1832, to assume the portfolio of the Interior in the Goblet-Devaux cabinet, and signalized his term of office by bringing into existence the Belgian railway system. He left the cabinet in 1834 for his old position of Governor of Antwerp, but reëntered the ministry in 1840 as head of the Department of Public Works and Education. The ministry fell in 1841 and Rogier was the leader of the Liberal Opposition in the Chamber of Deputies till 1847, when he was called upon to form a ministry, in which he held the portfolio of the Interior. French influence forced his retirement in October, 1852, but he returned to power in November, 1857, and remained in office for 11 years, acting as Minister of the Interior till 1861 and after that as Minister for Foreign Affairs. Consult Descailles, *Charles Rogier, 1800–85* (Brussels, 1896).

ROGUE (rōg) **RIVER INDIANS.** A small Athapascan speaking tribe in western Oregon, also known as Tututni. They number 383. See ATHAPASCAN STOCK.

ROHAN, rô'ăN', HENRI, DUKE DE (1579–1638). A French Huguenot general, son of Duke René II and Catharine de Parthenay (heroine of La Rochelle, heiress of the house of Soubise, q.v.). He was born at the Château de Blain in Brittany. About 1595 he was sent to the court of Henry IV, and in 1597 distinguished himself at the siege of Amiens. Then he spent more than two years in travel. In 1603 he was made Duke; two years afterward he married the daughter of the King's great minister, Sully; but he did not come into prominence until the death of Henry IV, when the leadership of the Protestant party fell to him. At Saumur in 1611 he effected a union of all the Huguenot factions, and in the same year he decided openly for Condé against Maria de' Medici, with whom he came to an understanding in 1616. But his efforts for union were unavailing, and, upon the rising of the Gascons and Béarnois against the reëstablishment of the Catholic church among them, he took the field openly, raised the siege of Montauban and forced the signature of the Peace of Montpellier and the confirmation of the Edict of Nantes (1623). He was made Marshal of France by Louis XIII, but Richelieu's policy was heedless of the treaty, and the Protestants rose again in 1625 under the lead of Rohan and his brother, the Prince de Soubise. Peace was made in 1626, but the struggle was soon renewed, ending in the triumph of the royal cause (1629). Rohan retired to Italy

and was named generalissimo of the Venetian troops in 1631; then returned to France on the invitation of Richelieu and after a brilliant campaign drove the Austrians and Spanish from the Valtelline (1635); and, after a brief retirement in Geneva, joined Bernhard of Weimar in 1638. In that year he was mortally wounded at Rheinfelden. Rohan wrote: *Mémoires* (1644), describing his three campaigns in France (ed. by C. Pradel, Paris, 1889); an account of his travels in 1598–1600 (printed 1646); *Les intérêts des princes* (1666); *Traité du gouvernement des treize cantons* (1644); *Discours politiques* (1693); and a fourth book of *Mémoires* on the war in the Valtelline (1785). Consult H. de La Garde, *Le Duc de Rohan* (Paris, 1884), and A. Laugel, *Henri de Rohan* (ib., 1889).

ROHAN, Louis René Edouard, Prince de (1734–1803). A French cardinal, born in Paris. He was bred to the Church, and was made Ambassador to Austria in 1772. He was recalled in 1774, having made himself offensive to Maria Theresa by his meddlesome spirit and scandalous mode of life. He became Grand Almoner of France, Cardinal in 1778, and Bishop of Strassburg the next year. He was imprisoned (1785–86) for his participation in the affair of the diamond necklace (q.v.), and on his release was dismissed from court in disgrace. He was a deputy to the States-General in 1789, but retired on account of accusations of disloyalty. He resigned the bishopric of Strassburg in 1801.

ROHAN, Marie de. See Chevreuse, Duchesse de.

ROHDE, rō'de, Erwin (1845–98). A German classical scholar, born in Hamburg and educated at Bonn, Leipzig, and Kiel. He became docent at Kiel in 1870 and professor there in 1872; between 1876 and 1886 he held chairs at Tübingen, Leipzig, and Heidelberg. He was an authority on the Greek novel and on the Greek cult of ghosts, and to these two subjects his great works, *Der griechische Roman und seine Vorläufer* (1876; 2d ed., 1900), *Psyche* (1890–94; 2d ed., 1897), and the posthumous *Kleine Schriften* (1901), are devoted. He published also, in the learned periodicals, valuable papers on the development of literary history among the ancient Greeks. Rohde wrote also *Friedrich Creuzer und Karoline von Günderode* (1896). Consult J. E. Sandys, *A History of Classical Scholarship*, vol. iii (Cambridge, 1908).

ROHILKHUND, or **ROHILKHAND,** rō'hĭl-kŭnd'. A division of the United Provinces of Agra and Oudh (q.v.), British India, occupying, together with the native State of Rampur, an area of 11,824 square miles. Pop., 1901, 6,010,527; 1911, 5,895,786. The principal town is Bareilly.

ROHLFS, rōlfs, Anna Katharine Green (1846–). An American novelist, daughter of a lawyer of Brooklyn, N. Y. She was educated at Ripley College, Poultney, Vt. Although married to Charles Rohlfs in 1884, she continued to write under her maiden name. She gained immediate popularity by her first novel, *The Leavenworth Case* (1878), an excellent detective story, in which she combined remarkable ability in the construction of plot with considerable knowledge of criminal law. Of many later stories, most of them in the same vein, may be mentioned: *A Strange Disappearance* (1879); *The Sword of Damocles* (1881); *Hand and Ring* (1883); *The Mill Mystery* (1886); *Behind Closed Doors* (1888); *The Forsaken Inn* (1890); *The Filigree Ball* (1903); *The Woman in the Alcove* (1906); *The House of the Whispering Pines* (1910); *Masterpieces of Mystery* (1913); *The Golden Slipper* (1915). She published also two books of poetry and a dramatization of *The Leavenworth Case* (1892).

ROHLFS, Gerhard (1831–96). A German explorer, born at Vegesack, near Bremen. After serving in the Schleswig-Holstein War in 1849 he took up the study of medicine and from 1855 to 1860 participated in the French wars in Algeria as a surgeon in the Foreign Legion. In 1861–62 he explored Morocco in the disguise of a Mohammedan, and penetrated the desert hinterland to the oasis of Tafilet. Setting out from Tangier in 1863, he was the first European to reach and describe the oasis of Twat. In 1865 he set out again, traversed the desert from Tripoli to Lake Chad, visited the Central African states of Bornu and Sokoto, and, entering the Niger by way of the Benue, sailed down that stream to Rabba, whence he forced his way through the forests to the Guinea coast. In 1868 he accompanied the British expedition to Abyssinia and after 1869 explored Cyrenaica and the oasis of Jupiter Ammon, traversing the Libyan desert, whither in 1873–74 he led a second expedition. He wrote: *Reise durch Marokko* (1869); *Land und Volk in Afrika* (1870); *Von Tripolis nach Alexandria* (1871); *Quer durch Afrika* (1874–75); *Beiträge zur Entdeckung und Erforschung Afrikas* (1876); *Reise von Tripolis nach der Oase Kufra* (1881); *Quid Novi ex Africa* (1886).

ROHRBACH, rōr'bäg, Paul (1869–). A German writer, concerned especially with "world politics." He was born at Irgen, Livonia. Between 1887 and 1896 he attended the universities of Dorpat, Berlin, and Strassburg, afterward he traveled extensively in Asia (especially China) and Africa, and in 1903–06 he was Royal Commissioner to southwest Africa. His writings include many books on political conditions in the countries visited by him, with much attention to the effects of German colonization and interests. His *Der deutsche Gedanke in der Welt* (1912) was translated into English by Edmund von Mach as *German World Policies* (1915), and *Der Krieg und die deutsche Politik* (1914) appeared in an English translation by P. H. Phillipson as *Germany's Isolation: An Exposition of the Economic Causes of the Great War* (1915). Most of the last-named book was written before the opening of the European War.

ROI DE LAHORE, rwä de là'ôr', Le (Fr., The King of Lahore). An opera by Massenet (q.v.), first produced in Paris, April 27, 1877.

ROI D'YS, dês, Le (Fr., The King of Ys). An opera by Lalo (q.v.), first produced in Paris, May 7, 1888; in the United States, Jan. 23, 1890 (New Orleans).

ROI D'YVETOT, dêv'tô', Le (Fr., The King of Yvetot). The title of a poem by Béranger (1813) telling of the contented King of the insignificant little mediæval Principality of Yvetot, near Rouen.

ROI S'AMUSE, rwä sà'mụz', Le (Fr., The King Amuses Himself). A drama by Victor Hugo, produced in 1832. The story was used by Verdi as the basis for the libretto of his opera *Rigoletto* (1851).

ROIS EN EXIL, rwä zän nĕg'zēl', Les (Fr., Kings in Exile). A story by Alphonse Daudet (1879).

ROJAS, rō'hȧs, Duke of. See Lerma, Francisco de Sandoval y Rojas, Duke of.

ROJAS, Fernando de. A Spanish character presumed to have flourished about 1500. For many years he was considered the author of the greater part if not the whole of the famous dramatic novel entitled the *Tragicomedia de Calisto y Melibea,* also known as the *Celestina,* the first known edition of which appeared in 1499. To-day few scholars believe that Rojas wrote this great work. For a full discussion of the problems concerning the *Celestina* and its supposed author, consult R. Foulché-Delbosc, in the *Revue Hispanique,* vols. vii, ix (Paris, 1900, 1902).

ROJAS ZORRILLA, thō-rē'lyȧ, Francisco de (1607–48). A Spanish dramatist. He produced plays in collaboration with Calderón, with Vélez de Guevara, and with Mira de Amescua, as well as notable original comedies, several of which were influential and imitated both in Spain and France. He also cultivated the sacred play or *auto.* The best known of his pieces are those entitled *Del rey abajo ninguno* (still interesting on the stage), *Lo que son mujeres,* and *Entre bobos anda el juego.* He himself published two volumes of his works, comprising some 24 plays, in 1640 and 1645. Some of his more important plays are to be found in the *Biblioteca de autores españoles,* vol. liv. Consult Emilio Cotarelo y Mori, *Francisco de Rojas Zorrilla, noticias biográficas y bibliográficas* (Madrid, 1911).

ROKITANSKY, rō'kē-tän'skē, Karl, Baron (1804–78). An Austrian pathologist, born in Königgrätz, Bohemia. He studied medicine in Prague and in Vienna (M.D., 1828), where he was professor of pathological anatomy from 1844 till 1875. He occupied several municipal medical positions and was active in politics. In the House of Lords he belonged to the liberal party, his speech on the separation of school and church being well known. In 1869 he was elected president of the Austrian Academy of Sciences and in the following year was created Baron. Rokitansky, more than any other one man, deserves the credit of establishing the scientific study of medicine upon the basis of pathological anatomy. He is said to have performed more than 100,000 post-mortem examinations. He published *Handbuch der pathologischen Anatomie* (1842–46; 3d ed., 1851–61; Eng. trans., 1849–52), which embodied his teachings. This, however, he greatly changed between the first and the second edition, giving up the idea of crases and stases accepted by him from solidism and humoralism. *Die Defekte der Scheidewände des Herzens* (1875) is also a classic.

RO'LAND, *Fr. pron.* rō'läN', The Song of (Chanson de Roland). An old French epic poem or *chanson de geste* of the end of the eleventh century, pronounced by competent critics one of the masterpieces of French literature. The work, consisting of 4002 assonant verses in decasyllabic form, arranged in *laisses* or stanzas of varying length, takes its name from its chief character, Roland, prefect of Brittany and, according to tradition, nephew of Charles the Great. Nothing definite is known concerning its author, though some commentators identify him with a certain Turoldus mentioned in the last verse. The narrative of the poem runs briefly as follows: Charles, King of the French, has for seven years successfully fought the Saracens of Spain. News of his victories reaches Marsile, commander of the infidels, who, fearing for his own sceptre, sends messengers to the French to sue for peace. After deliberation Charles appoints Ganelon, the personal foe of Roland (here represented as Roland's stepfather), to arrange terms with Marsile. Ganelon artfully proposes to Marsile to betray the French rear guard under Roland into Marsile's hands when the main army of Charles shall be fairly on its way home. The plan is accepted; Ganelon returns to Charles, and the French army crosses the Pyrenees into France, while Roland remains behind in the mountains with a guard of 20,000 men. At Roncevaux, or as the text says Roncesvals (the plain of Ros), he and his valiant band are overwhelmed by a pagan army of 20 times their number. The details of this disaster, which Europe regarded during centuries as the representative struggle of Christian against Moslem, constitute the kernel and real beauty of the poem. His boon companion Oliver beseeches Roland to wind his horn and bring Charles to the rescue. Only when his doom is complete will Roland raise the horn to his lips and summon his liege with his dying breath. The poem then draws rapidly to a close. Charles reënters Spain on the same day, utterly routs the pagans, and returns to France, sorrowful but triumphant. At the tidings of Roland's death Alde, his betrothed (Oliver's sister), falls lifeless at the Emperor's feet. Ganelon is finally found guilty by the judgment of Heaven and is condemned to be torn limb from limb by infuriated stallions.

In this form the *Chanson de Roland* was carried to almost every nation in Europe. It was put into German verse by a certain Conrad about 1130, later into Norse prose and into English verse; the story early penetrated to Italy; it was known to Dante, and after several recastings it was adapted to the national character by the poets Pulci (*Morgante maggiore*), Boiardo (*Orlando innamorato*), Ariosto (*Orlando furioso*), and Berni (*Orlando amoroso*). In Spain national jealousy displaced religious zeal. Roncevaux became a Spanish victory and the dawn of Spain's national glory. Finally the legend cast abroad the names of its heroes, some of which became localized in foreign parts, notably Roland in northern Germany about Bremen.

The historical facts underlying the story are told by Einhard, the biographer of Charles the Great. He relates that on Aug. 15, 778, while passing through a defile of the Pyrenees, part of the French army was attacked by the mountaineers, the Basques, who, owing to their light armor, gained an easy victory. In this battle perished "Eggihard, provost of the royal table; Anselm, count of the palace; and Roland (*Hruotlandus*), prefect of the March of Brittany." This is the sole dictum of history on the hero's character. But two Latin works, a chronicle of the twelfth century attributed to Turpin and a poem *De Proditione Guenonis* of the same date, reveal two versions of the legend preceding that represented by the French poem. From evidence in these works it is held that the legend of Roland was first fashioned in Brittany, recast in Anjou, and given its present form in the country surrounding Paris or the *Ile de France.* The best manuscript of the French

poem is the famous Digby 23 of the Bodleian Library, Oxford; it is apparently in the writing of a scribe of the middle of the twelfth century.

As a literary production, the *Chanson de Roland* is worthy to be classed with the two other great mediæval epics, the *Beowulf* and the *Nibelungenlied*.

Bibliography. Seelmann, *Bibliographie des altfranzösischen Rolandsliedes* (Heilbronn, 1888); J. Bédier, *Les légendes épiques* (4 vols., Paris, 1908–13). The best editions of the text are by Müller (Göttingen, 1878); by Gautier (Tours, 1899); by Stengel (Leipzig, 1900). For criticism, consult especially Gaston Paris, *Poèmes et légendes du moyen âge* (Paris, 1900). Translations: Rabillon (New York, 1888), in blank verse; John O'Hagan (new ed., Boston, 1904), in the metre of "Christabel"; Isabel Butler, in the *Riverside Literature Series* (ib., 1904), in English prose; Leonard Bacon (New Haven, 1914), in verse; an excellent German translation is that of William Hertz (Stuttgart, 1861); and by far the best in modern French is the blank-verse translation of Joseph Fabre (Paris, 1902).

ROLAND DE LA PLATIÈRE, de là plâ'-tyâr', Jean Marie (1734–93). A French politician, born at Thizy, near Villefranche (Yonne). He was early forced to shift for himself, but succeeded in becoming an authority in matters pertaining to industry and commerce and received an appointment as inspector ordinary of manufactures at Amiens. In 1775 he met Marie Jeanne Philipon, a young woman 20 years his junior, a brilliant and fascinating beauty, and they were married Feb. 4, 1780. When the Revolution broke out in 1789, Roland, who was then living at Lyons, became a decided partisan of the movement. In 1791 he was sent to Paris by the municipality to present to the Constituent Assembly the deplorable condition of the Lyonnese weavers. After the dissolution of the Constituent Assembly he founded at Lyons the Club Central, the members of which, marked by their attachment to constitutional liberty, received the name of Rolandins. Towards the close of 1791 he settled in Paris and soon became one of the recognized leaders of the Girondists. In March, 1792, he was appointed Minister of the Interior, a post which, with the exception of the period between June 10 and Aug. 10, 1792, he held till January, 1793, when he resigned in despair of seeing moderate counsels adopted. Upon the fall and proscription of the Girondists he fled and concealed himself in Rouen. When news reached him of the execution of his wife, he committed suicide at a small village in the environs of Rouen, Nov. 15, 1793. Roland wrote and published several memoirs and disquisitions on branches of industry, the most important work being the *Dictionnaire des manufactures et des arts* (Paris, 1785–90). He was also a contributor to the *Encyclopédie Nouvelle*. His letters to his wife before they were married have also been published in part.

ROLAND DE LA PLATIÈRE, Marie or Manon Jeanne Philipon, Madame (1754–93). A leader of society at the time of the French Revolution. She was the daughter of Pierre Gratien Philipon, an engraver, and was born in Paris, March 17, 1754. In 1780, after a friendship extending over five years, she married Jean Marie Roland de la Platière (q.v.), and her subsequent career is closely identified with his political life. During the Revolution she became prominent in Parisian literary and political life, and her salon was frequented by Brissot, Buzot, Pétion, Robespierre, and other Revolutionary leaders. After the fall of the Girondists she was arrested June 1, 1793, and lodged in prison, where she spent her time in writing her *Mémoires* (4 vols., ed. by Dauban, Paris, 1864). After a summary trial before the Revolutionary Tribunal, Madame Roland was led to the guillotine and bravely met death Nov. 8, 1793. Consult: Dauban, *Etude sur Madame Roland* (Paris, 1864); Mathilde Blind, *Madame Roland* (ib., 1886); Austin Dobson, *Four French women* (London, 1890); I. M. Tarbell, *Madame Roland* (New York, 1911); I. A. Taylor, *Life of Madame Roland* (ib., 1911). Madame Roland's *Lettres* have also been published (Paris, 1867).

ROLF, rölf. See Rollo.

ROLFE, John (1585–1622). An English colonist in America, born in Norfolk, England. He became interested in the colonization of Virginia and in June, 1609, started for the Colony, but was wrecked on the way, was detained for some months on the Bermuda Islands, and did not reach Jamestown until May, 1610. In 1612 Rolfe began the regular cultivation of the tobacco plant in Virginia, being the first English settler to do so. He had married an English woman in 1608, but his wife had died soon after her arrival at Jamestown, and in April, 1613, he married the famous Indian princess Pocahontas (q.v.), whom he took to England in 1616. After the death of Pocahontas, in 1617, Rolfe returned to Virginia, where he again married, and in 1619 was a member of the Council.

ROLFE, John Carew (1859–). An American classical scholar, son of William J. Rolfe. He was born at Lawrence, Mass. He graduated from Harvard University in 1881 and from Cornell (Ph.D.) in 1885. In 1888–89 he studied at the American School at Athens and assisted in important excavations during that year. He taught at Cornell University from 1882 to 1885 and at Harvard University in 1889–90. In the latter year he was appointed assistant professor at the University of Michigan and four years later was made professor of Latin. This office he continued to hold until 1902, when he was appointed to a similar position at the University of Pennsylvania. In 1907–08 he was professor at the American School of Classical Studies in Rome. He became co-editor with Prof. Charles E. Bennett of Cornell of the *College Latin Series*, edited various Latin texts for schools and colleges, and contributed many articles to various learned periodicals. In 1910–11 Rolfe served as president of the American Philological Association.

ROLFE, Robert Monsey, Baron Cranworth. See Cranworth.

ROLFE, William James (1827–1910). An American Shakespearean scholar and educator, born in Newburyport, Mass. He graduated at Amherst in 1849 and between 1852 and 1868 was head master of high schools at Dorchester, Lawrence, Salem, and Cambridge, Mass. In 1904–06 he was president of the Emerson College of Oratory at Boston. He served as editor of the *Popular Science News* and afterward of the Shakespearean department of the *Literary World* and the *Critic*. Early in his career (1866) he had edited selections from Ovid and Vergil and, in collaboration, the *Cambridge Course of Physics* (6 vols., 1867–68), and he

contributed many articles to the magazines. His Shakespearean work began with an edition of George L. Craik's *English of Shakespeare* (1867). This led to the preparation of a complete edition—the Friendly edition—of Shakespeare (40 vols., 1870–83; new ed., 1903–07). He also edited a complete edition of Tennyson (12 vols., 1898) and verse by many of the other great English poets; also some prose works. Rolfe was author of *Shakespeare the Boy* (1896); *The Elementary Study of English* (1896); *Life of Shakespeare* (1901); a very useful *Satchel Guide to Europe*, revised annually for 35 years; *Life of William Shakespeare* (1904); *Shakespeare Proverbs* (1908). He contributed the article "Shakespeare" to the NEW INTERNATIONAL ENCYCLOPÆDIA. A *Bibliography of W. J. Rolfe* was published in Cambridge in 1907. For his son, see ROLFE, JOHN CAREW

ROLL, rôl, ALFRED PHILIPPE (1846–1919). A French genre, historical, landscape, and portrait painter. He was born in Paris, was the pupil of Harpignies, Gérôme, and Bonnat, and one of the first plein-air painters. His art is broad, strong, and full of vitality and charm. He first gained success in 1875 with a military episode "Halt" (Versailles Museum), but most of his earlier subjects are taken from the life of the peasant and the artisan. These include "The Strike" (1880; Museum of Valenciennes); "Work" (1885); "The Flood at Toulouse" (Havre Museum). His power of depicting crowds is shown in "The Centenary of the 5th of May, 1779" (Versailles); "War" (1887; Luxembourg); "The National Fête of the 14th of July, 1880" (Petit Palais); while his official canvases, such as "Dedication of the Alexander III Bridge," are among the finest of their kind. His rural subjects, "In Normandy" (1883), "Manda Lamétrie, Fermière" (1888; Luxembourg), "Woman with a Bull" (1889), are examples of his delicate handling of light. His skill as a draftsman is best exhibited in "The Joys of Life" (1892–96; Hôtel de Ville, Paris) and a number of other purely decorative paintings. His highly expressive portraits include those of Jane Hading, Madame Paquin, and Coquelin Cadet. His versatility finds further expression in spirited studies of horses, marines, landscapes with figures, and vigorous and brilliant pastels. Roll became Commander of the Legion of Honor and was one of the founders and for many years president of the Société National des Beaux-Arts. An exhibition of his work was held in New York in 1915. Consult Fourcaud, *L'Œuvre de Alfred Philippe Roll* (Paris, 1896), and Valmy-Baysse, *Peintres d'aujourd'hui* (ib., n. d.).

ROLLAND, rō'läN', ROMAIN (1866–). A French author, born Jan. 29, 1866, at Clamecy. He was educated at the Ecole Normale Supérieure, where he was afterward professor of the history of art until called to a chair at the Sorbonne. His doctor's thesis, *Les origines du théâtre lyrique moderne* (1895), was crowned by the Academy. Subsequently he wrote a number of plays, rather poorly constructed, but characterized by psychological analysis, style, and vigor. Among these are: *Aërt* (1898); *Le triomphe de la raison* (1898); *Danton* (1901); *Le 14 juillet* (1902). He also published notable biographical and critical studies (largely of musicians) and other works: *Beethoven* (1903; new ed., 1913); *Vie de Michel-Ange* (2 vols., 1907; in Eng., 1915); *Musiciens d'autrefois* (1908; in Eng., 1915); *Musiciens d'aujourd'hui* (1908; in Eng., 1915); *Le théâtre de la révolution* (1909); *Vie de Tolstoi* (1911; in Eng., 1911); *L'Humble vie héroique* (1912); *Les maîtres de la musique* (1912). In the field of one of his main interests he founded in 1901, with Combarien and others, the *Revue Musicale*, to which he contributed frequently thereafter. But it was his *Jean Christophe* (in 3 parts and originally in 10 vols., 1904–12) that brought to Romain Rolland one-fourth of the Nobel prize in literature for 1915. The author calls this work the tragedy of a generation that is about to disappear. Jean Christophe cannot be called the hero, and the book itself is really not a novel. Its principal character is a romantic medium through which the author presents his philosophy or world outlook. He takes a musician of genius, places him in contemporary society, and makes him feel all the emotions and experience all the trials that would be the lot of an artist and thinker. The titles of the parts are: "Jean Christophe," "Jean Christophe in Paris," "Journey's End"; of the volumes: "Dawn," "Morning," "Youth," "Revolt," "The Market Place," "Antoinette," "The House," "Love and Friendship," "The Burning Bush," "The New Dawn." As the inevitable result of its enormous size the work lacks cohesiveness, clarity, and proportion. Even the author himself, apparently growing weary, is unable to keep his narrative on its early high plane. The romantic element will probably live; the philosophical discussion could be much abridged without loss. *Jean Christophe* was translated into English by Gilbert Cannan (1911–13) and into German.

Consult Winifred Stephens, *French Novelists of To-Day* (2d series, New York, 1915).

ROLLE DE HAMPOLE, rōl dĕ hăm'pōl, RICHARD (c.1290–1349). An English author, born in Yorkshire. He studied theology at Oxford, but he left the university at the age of 19 and became a hermit. He moved about in the north, settling eventually in a cell at Hampole, near Doncaster. He was famed for his learning, preaching, and holy life. Rolle composed many treatises both in Latin and in English, some of which yet remain in manuscript. His English works, written in the Northumbrian dialect, were widely read. Most popular was *The Pricke of Conscience* (ed. by R. Morris for the Philological Society, 1863), a poem of 9624 lines rhyming in pairs. It gives a complete view of human life from the extreme ascetic standpoint. Other English works by Rolle are a paraphrase of the *Psalms and Canticles* (ed. by Bramley, Oxford, 1884); *English Prose Treatises*, 10 in number (ed. by Perry for the Early English Text Society, London, 1866); and the *Miscellanies* (ed. by Horstmann under the title *Richard Rolle of Hampole and his Followers*, 2 vols., London, 1895–96). Two of the Latin treatises—*De Emendatione Vitæ* and *De Incendio Amoris*, translated into English by Richard Misyn in the fifteenth century—were edited by R. Hardy for the Early English Text Society (London, 1896), and Margaret Deanesly edited the *Incendium Amoris* (New York, 1915). Rolle's English works are of great philological interest as specimens of the English written in the North.

ROLLER. See GROUND SEA.

ROLL'ER. A bird of the family Coraciidæ, related to the broadmouths, todies, and motmots.

All the many rollers are inhabitants of the warm and forested parts of the Old World and are noted for gorgeous coloring. They take their name from a habit of tumbling in the air like a tumbler pigeon and have a curious habit of tossing their food, which consists of insects and parts of plants, into the air and catching it in their mouths. One only is found in Europe, the common roller (*Coracias garrulus*), a bird nearly equal in size to a jay. Besides the genus *Coracias* there are the broad-billed rollers of the genus *Eurystomus*, found in Africa and tropical Asia, and at least four genera of remarkable rollers confined to Madagascar.

ROLLER BEARING. See BEARING.

ROLLERS. See ROAD AND STREET MACHINERY.

ROLLER WORM, or **ROLL WORM.** The larva of a hesperid butterfly (*Eudamus proteus*), which rolls the leaves of beans and peas in the Southern Atlantic States. The large eggs are laid upon the leaves in clusters of from four to six. The larva, which is yellow-green and has a slender neck and large head, cuts a slit in the leaf from the edge, rolls the flap around its body, and works from the inside of this roll with its soft parts perfectly protected. When fully grown it is 1.5 inches long and transforms to a chrysalis within the leaf roll. The adult butterfly is dark brown, the front wings having several silvery white spots. In a small garden it may be kept in check by hand picking, but the use of an arsenical spray is necessary in large fields.

ROLLESTON, rōl'ston, THOMAS WILLIAM HAZEN (1857–). An Irish author, born in King's County and educated at St. Columba's College, and at Trinity College, Dublin. From 1879 to 1883 he lived in Germany. On his return to Ireland he became editor of the *Dublin University Review*, lectured, was a leader writer for Dublin papers and a Dublin correspondent of English papers, and an active worker in various organizations designed to further the literary, artistic, and economic interests of his country. He was prominently identified with the Irish Literary Revival. (See IRISH LITERATURE, *in English.*) The *Treasury of Irish Poetry* (1900), which he and the Rev. Stopford A. Brooke edited jointly, is, with its admirable biographical and critical matter, an anthology of great value. Besides this, Rolleston's publications include, notably: *The Teaching of Epictetus* (1888); *Grashalme* (1889), a German translation of Walt Whitman, with Karl Knortz; *Life of Lessing* (1889); *Imagination and Art in Gaelic Literature* (1900); *Parallel Paths: A Study in Biology, Ethics, and Art* (1908); *Sea Spray* (1909), poems; *The High Deeds of Finn* (1910); *Myths and Legends of the Celtic Race* (1911); *Tannhäuser: A Narrative Poem* (1911); *The Story of Parsifal* (1912); *Lohengrin* (1913); *Sacred and Profane Love: A Trilogy after Richard Wagner* (1914).

ROLLETT, HERMANN (1819–1904). An Austrian poet and art critic, born in Baden, near Vienna. Because of the radical tone of his political poetry, *Frühlingsboten aus Oesterreich* (1845), published while he was in Germany, he was forbidden to return to Austria and was later expelled from several German states. His principal works are: *Frische Lieder* (1848; 2d ed., 1855); *Republikanisches Liederbuch* (1848); *Die Kirmes*, a series of songs, with music by Abt (1854); *Offenbarungen* (2d ed., 1870); *Märchengeschichten aus dem Leben* (1894). Rollett wrote some dramas and also two valuable works on art, *Die drei Meister der Gemmoglyptik* (1874) and *Die Goethe-Bildnisse* (1882). Consult Leopold Katscher, *H. Rolletts Leben und Werke* (Vienna, 1894).

ROLLIN, rō'lăN', CHARLES (1661–1741). A French historian, born in Paris. He studied at the Collège du Plessis, where in 1683 he became assistant to the professor of rhetoric, and five years later he was made professor of eloquence in the Collège de France. In 1694 he was chosen rector of the University of Paris, a dignity which he held for two years. In 1696 he was appointed coadjutor to the principal of the Collège de Beauvais, but, being an ardent Jansenist, he was removed in 1712 through the influence of his opponents. In 1715 he published an edition of Quintilian and in 1726 the *Traité des études*, his best literary works. His most famous work is the compilation, formerly of great popularity, known as the *Histoire ancienne* (13 vols., Paris, 1830–38), which has frequently been reprinted and reëdited both in French and in English, but is of little historical value. He also began a *Histoire romaine*, which was completed by Crevier and other historians after Rollin's death and was published in nine volumes (Paris, 1738–48).

ROLLIN, LEDRU-. See LEDRU-ROLLIN.

ROLLINAT, rō'lē'nà', MAURICE (1846–1903). A French poet. He was born at Chateauroux, but went to Paris in 1868 and became associated with the Parnassian school. (See PARNASSIENS, LES.) His fine verse is to some extent reminiscent of the surroundings of his birthplace, but in another direction he was influenced by Poe, Baudelaire, and Barbey d'Aurevilly. The death of his wife unbalanced him, and he died insane. The volumes of his poetry are entitled: *Dans les brandes* (1877); *Les névroses* (1883); *L'Abême* (1886); *Les apparitions* (1896); *Paysages et paysans* (1898).

ROLLING MILL. Rolling is the operation of reducing the section of pieces of metal by passing them between revolving cylinders or rolls. A rolling mill consists essentially of the rolls set in a suitable framework to support them, called housings, and connected with the engine or motor, the use of electricity as the motive power being one of the most important of recent developments. Rolls were first introduced by Brulier, a Frenchman, in the sixteenth century for producing strips of precious metals for coinage purposes, and it was not until the eighteenth century that they were employed in the iron industry. In *Husbandry and Trade Improved* (1697) John Houghton speaks of slitting and rolling mills as late improvements, and John Payne and Major John Hanbury rolled sheet iron at Pontypool, Wales, in 1728. The rolls were plain, i.e., simple cylinders, but about this time Payne conceived of putting grooves in them. It was not, however, until 1783 that this was successfully accomplished by Henry Cort, although patents on this subject had previously been granted.

Rolling is generally performed hot, practically always as a preliminary operation at least. In some cases the metal may be cold rolled to secure greater accuracy, smoothness or freedom from scale, and occasionally on account of the increased strength secured by the cold working. In forging the piece is laid upon the anvil and remains stationary during the time required for

the blow or squeeze and is moved only after this has taken place. In rolling, on the other hand, the rolls revolve and are maintained rigidly in one position (at least during one pass), while the piece receives its reduction by being continuously drawn through them. The pressure is not applied directly in the plane connecting the axes of the rolls, but at an angle which varies slightly, depending upon the thickness and the amount of reduction and also upon the diameter of the rolls.

When the piece goes through the rolls, if there are no grooves or collars to support it on the sides, a certain amount of transverse extension will take place, but on account of the movement of the rolls, the principal extension will be in a horizontal direction, i.e., in the direction in which the piece is traveling. From this

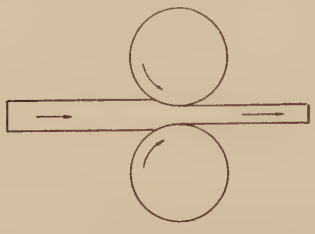

FIG. 1. MANNER IN WHICH PIECE IS REDUCED.

it comes that, if the rolls are horizontal, the thickness of the piece will be reduced, while the width will be slightly increased; with vertical rolls the width will be reduced and the thickness somewhat increased. It will therefore be seen that, if both the thickness and the width are to be reduced, it will be necessary either to (*a*) turn the piece 90 degrees or (*b*) employ both horizontal and vertical rolls.

The earliest type of rolling mill consisted of two plain, horizontal rolls superimposed (one placed directly over the other), which were revolved continuously in one direction; hence, when the piece had been given one pass and before it could be given another, it was necessary to bring it back to the side of the rolls at which it started. To do this it was laid on top of the top roll and so carried back, of course without receiving any work, and for this reason such an arrangement is called a pull-over or pass-over mill. This is the type still commonly em-

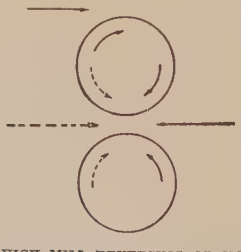

FIG. 2. TWO-HIGH MILL REVERSING OR NON-REVERSING.

ployed in the sheet and tin plate business for producing thin sheets.

To George Fritz is due the credit of devising what is known as the three-high mill. This was done by placing a third roll above the other two, rotated in the same direction as the bottom roll. Such a mill was first operated at the Cambria Works, Johnstown, Pa., in 1857. The original type was then known as a two-high mill.

Up to this time the rolls had always been run continuously in one direction, but in 1866 Ramsbottom built a two-high mill at Crewe, England, which could be reversed, i.e., after the piece had gone through in one direction the direction of rotation of the rolls was reversed and the piece given another pass on its way back. This is called a reversing mill and effects the same results as Fritz's three-high mill, but the methods of handling the piece are somewhat different. The advantages of the three-high mill over the reversing type of mill are that, since the engine is always run in one direction, a heavy flywheel can be employed which will materially assist the engine in pulling the piece through the rolls, and during the intervals when no steel is being rolled it is storing energy; hence such a powerful engine or motor is not required, and, furthermore, it can be constructed somewhat differently and more advantageously. To do a certain amount of work it is more economical of power, but since it must be kept running, even when not actually rolling, the total consumption for the two is about the same. One drawback over the reversing mill is the fact that the piece must be alternately raised and lowered when it has to go between the top and the middle and the bottom and the middle rolls respectively. This means that the roll tables must be arranged to be raised and lowered, while with only two rolls the tables are stationary and are consequently far less likely to get out of order and require tedious and costly (from the fact that the mill is forced to be idle) repairs.

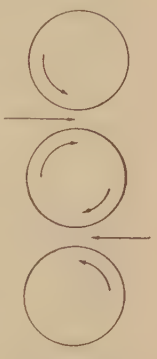

FIG. 3. THREE-HIGH MILL.

Cort's mill with grooved rolls, at first used only for plain, i.e., rectangular pieces, was readily applied for producing pieces of various sections. When used for small bars or sections it is called a bar or merchant mill, while for larger ones it is known as a shape mill (in England this is termed a section mill). In the United States bar and shape mills are nearly always three-high or in stands of two-high non-reversing on the continuous or semicontinuous principle, which will be explained more fully farther on; abroad they are frequently two-high, for large sections reversing and for small section of either the reversing or the pull-over type.

More recent modifications have consisted in making improvements and changes in the details, the principles remaining the same. Thus, a number of stands may be connected together, end to end, producing what is called a train; or the stands may be arranged one in front of the other, giving rise to one type of continuous mill; or finally, there may be several combinations of the preceding. There are a number of the so-called special mills, such as the Grey, the Sack, etc.

The size or rating of a mill for everything but plates is based on the diameter of the rolls or, more strictly speaking, on the distance between the centres of the pinions; thus, a 38-inch or a 12-inch mill means that these are the respective distances between the centres of the pinions. In the case of plate mills the size

given has to do with the width of plate which can be rolled, which in turn depends on the type of mill. Thus, a 48-inch universal mill can produce finished plates up to 48 inches wide; a 140-inch (sheared) mill means that the length of the barrel of the rolls is 140 inches, and on account of the impossibility of having the plate extend beyond this the extreme width will be about 136 to 138 inches; in addition to this a certain allowance, varying with the thickness and the length of the piece, must be made for side shearing.

In addition to the rolling mill, engine or motor, and tables there must be provided the necessary soaking pits or heating furnaces, cranes, straightening rolls or gag presses, etc., shears and railway system for handling the material in its various stages. See STEEL SHAPES.

ROL'LO, HROLF, ROLF, or ROU (real name HRÓLFR, known as the Ganger, or Walker). A Norse chieftain, the son of the Norwegian Ragnvald Mörejarl. He effected extensive conquests in northwestern France, and by the Peace of Clair-en-Epte, about 911, he was granted by King Charles the Simple of France the possession of Rouen and the adjacent territory which he already had seized. This was the origin of the Duchy of Normandy. He divided his lands among his followers, framed laws for his people, and made great donations to the Church, to which he had been converted. He was a faithful ally of Charles the Simple. By successful wars he gradually extended his possessions. Rollo and his followers and their descendants are, strictly speaking, the Normans of history. Rollo himself became the ancestor of Norman dukes, kings, and crusaders. About 927 he associated his son William Longsword with himself as ruler. He died about 931. Consult E. A. Freeman, *The Norman Conquest*, vol. i (Oxford, 1867), and Gjerset, *History of the Norwegian People*, vol. i (New York, 1915). See NORMANS.

ROLLS. The judicial records of the ancient English courts. The term originated at a time when bookbinding was not common, and it was the custom to write the records of court proceedings upon sheets of parchment, which were fastened together and rolled up for preservation and convenience in filing. Many of these records have been preserved, and they constitute an invaluable store of information as to the practice of the courts of England from the earliest period down through the Tudor régime. See MASTER OF THE ROLLS; RECORDS, PUBLIC.

ROLL WORM. See ROLLER WORM.

ROLPH, rōlf, JOHN (1793–1870). A Canadian political leader. He was born in Thornbury, England, studied medicine under Sir Astley Cooper, was afterward called to the bar, emigrated to Canada, and settled in the County of Norfolk, whence subsequently he removed to Dundas and thence in 1832 to York (Toronto). For many years he practiced both law and medicine, attaining high success in each profession, but his political activity after his removal to Toronto was the outstanding feature of his life. For some years he sat in the Upper Canada Assembly as a Reform member and was distinguished for his eloquence and argumentative power, especially in supporting the secularization of the Clergy Reserves. (See CANADA, *History.*) Constitutional agitation failing to dislodge the Tory party from office, Rolph joined the more radical Reformers, of whom William Lyon Mackenzie (q.v.) was the leader, and in November, 1837, agreed with the latter and his supporters to attempt the capture of Toronto. The attempt failed, the insurrectionists were dispersed by government troops, and Rolph fled to the United States, afterward living for several years in Russia. He was pardoned and returned to Toronto in 1843, where he resumed the practice of medicine. In 1851 he founded a medical school, afterward incorporated as a department of Victoria University and now a faculty of Toronto University. Consult: J. C. Dent, *Canadian Portrait Gallery* (Toronto, 1880); *The Story of the Upper Canada Rebellion* (ib., 1885–86); John King, *The Other Side of the Story of the Upper Canada Rebellion* (ib., 1886).

ROM, or **ROMANY.** See GYPSIES.

RO'MA. An opera by Massenet (q.v.), first produced at Monte Carlo, Feb. 17, 1912.

ROMAGNOSI, rō'mä-nyō'zē, GIOVANNI DOMENICO (1761–1835). An Italian jurist, born at Salsomaggiore. He was educated at Piacenza and became instructor in law at Parma in 1803 and professor of law at Padua in 1806. The downfall of Napoleon caused him to leave the last place. He became professor of law at the University of Corfu in 1824. Romagnosi in his teaching extolled society as the natural condition of man, upheld the state against the individual, and repudiated the contract theory of the origin of society. His two most important works are the *Genesi del diritto penale* (1786) and *Introduzione allo studio del diritto pubblico universale* (1805). His *Opere* were published at Florence in 1832–35.

ROMA'IC (ML. *Romaïcus*, from Gk. *Ρωμαϊκός, Rhōmaïkos*, Roman, Latin, Byzantine, from *Ῥώμη, Rhōmē*, Lat. *Roma*, Rome, later also Byzantium). The vernacular language of modern Greece. See GREEK LANGUAGE, *The Greek Language, Modern;* ROMAIC LITERATURE.

ROMAIC LITERATURE. The modern Greek literature. (See GREEK LANGUAGE, *The Greek Language, Modern.*) It is commonly regarded as belonging to the period that begins after the overthrow by the Turks of the Byzantine Empire (1453 A.D.). But Romaic literature considered as the written expression of Romaic speech began at least three centuries earlier. By some Theodoros Prodromos (Ptochoprodromos), of the earlier half of the twelfth century, has been considered the first modern Greek writer. His begging poems, written in the so-called political verse and in the vulgar language, are a most interesting literary and linguistic monument. But Prodromos was not the first Romaic writer. The popular epic material out of which the metrical romance of Diogenes Akritas was afterward constructed belongs to an earlier period, and Romaic prose documents composed in Lower Italy carry us back to the tenth century. The metrical *Chronicle of the Conquest of the Morea*, which deals with the foundation of the feudal principalities in Greece after the Fourth Crusade, was composed before 1326. In the earlier period of Romaic literature Constantinople, Cyprus, and Crete were the chief centres of production. Didactic, erotic, and allegorical poetry, legal and historical writings in prose, are among the forms of literature represented. To a Cretan poet of Venetian origin, Vincenzo Cornaro (c.1550), belongs the title of the modern Homer. His long romantic poem *Erotocritos*, in which,

in the mediæval manner, the loves of Erotocritos, the son of an Athenian courtier, and Aretusa, the daughter of Heracles, King of Athens, are narrated, is still a great favorite with the Greek populace. Greek prose writing from the fall of Constantinople to the latter half of the eighteenth century is substantially but the continuation and propagation of the later Byzantine literature and scholarship. In the sixteenth century we have a translation and an original poem, in modern Greek, by Demetrius Zenus (q.v.). But under Turkish rule, particularly in northern Greece, a mass of most striking and interesting popular poetry, composed and transmitted unwritten, accumulated. In this the life, the emotions, the superstitions of the Greek people are reflected. In the Klephtic songs, in which is vividly portrayed the spirit of the mountaineers of Thessaly and Epirus, who were sometimes a sort of local police in Turkish pay, sometimes brigands (see KLEPHTS), we find expressed that love of liberty and hatred of the oppressor which were to culminate in the revolution of 1821. Noteworthy among these poems is the *Quarrel of Olympos* and *Kissavos* (Ossa), which was translated, together with other popular Romaic poems, by Goethe. Of other poems "love and love's pain" is the burden; of yet others death and Charos, the modern Greek death god, are the theme. (See CHARON.) The prophet of the spirit of liberty, which was gaining greater power under the influence of the French Revolution, was Rhegas of Velestinos (Pheræ) (1754–98). Rhegas, who lived in the service of the Greek Hospodar of Wallachia and who paid the price of his patriotism with his life, is the author of the rousing war song, *On, Sons of the Hellenes!* The stirring poem, *How Long, Pallicars?* is also commonly ascribed to him. Of a different type was the man often regarded as the modern Greek Anacreon, Athanasios Christopulos (q.v.) (1772–1847), who spent an epicurean existence at Bucharest, imitating the *Anacreontica* in Romaic and troubling himself little about the regeneration of Greece. Noteworthy also is the satiric fabulist Ioannes Velaras of Epirus (1773–1823), who was physician to Veli Pasha, son of the infamous Ali Pasha of Janina. Among the cultivators and developers of Romaic prose style a very prominent place should be given to the first great modern Greek scholar, Adamantios Koræs, who left his mark upon classical as well as modern Greek philology. (See CORAY, ADAMANTIOS.) He took a middle position in the strife that arose at the beginning of the revival of national life between the purists and the vulgarists in Romaic speech and writing. The current Greek style of to-day occupies in general this vague middle ground, but the most vital and original literature of the Greeks is still, in poetry at least, in the vulgar tongue.

In this tongue, in the form of it current in the Ionian Islands, the great poet of the Greek revolution, Dionysios Solomos, a writer of zeal and eminent genius, wrote. He was born in Zante in 1798. He studied law at Venice, Cremona, and Padua and developed his literary knowledge and poetic talent by association with the poets of the day, particularly Monti, and by reading the Italian classics. On his return to Zante in 1818 he began to study popular Romaic poetry with the practical help, it is said, of an old blind minstrel. The Klephtic lays were a new inspiration to him. Perhaps the greatest production of his genius is his *Hymn to Freedom*, prompted by the first triumphs of the Greek revolution. Not the least striking passage in this great poem is that in which the innumerable company of the ghosts of those that had been "slain by Turkish wrath" inspire by their unfelt touch the sleeping Greek army before Tripolitza. The *Hymn to Freedom*, set to fit music, is now the national hymn of Greece. Solomos' poem *On the Death of Byron* is also a noble work, though written in a difficult and involved style. Among the shorter poems of Solomos may be mentioned *The Poisoned Girl*, weirdly pathetic; *The Blond Girl;* and the six lines—a true *multum in parvo*—on the island of Psara after its devastation by the Turks. Solomos died in 1857 in Corfu, where he had spent the latter part of his life. To what may be called the school of Solomos belong Julius Typaldos of Cephalonia (1814–83) and G. Markoras of Corfu (1826–). A poet of distinct merit, who belongs to the western islands, but drew his inspiration as well as his blood from the hardy Epirotes, is Aristoteles Valaorites of Santa Maura (Leucas) (1824–79). Another poet, able but too much influenced by the puristic style, is George Zalakostas (1805–58). Of merit, too, as a lyric poet is Achilles Paraskhos (1833–95). Among the numerous Greek poetical writers of lesser merit since the revolution may be mentioned the widely learned and overclassical Alexander Rizos Rhangaves (Rangabé, q.v.) (1810–92) and Alexander Soutsos (1808–63), who contributed by his satiric verse to the unpopularity of the unfortunate President Capodistria. Dimitrios Bikelas (q.v.), of whom more must be said presently, is better known as a prose writer than as a poet, although he has written graceful verse and made poetical translations of a number of Shakespeare's plays. Another writer of verse holds a unique place in modern Greek literature. This is George Soures, who for many years published weekly a small, four-page, satirical paper, the Ῥωμηός, roughly illustrated by himself and written in clever doggerel. His very personal, slashing satire, combined with poetic talent, caused Soures to be called by some the modern Aristophanes. (See L. M. J. Garnett, *Greece of the Hellenes*, p. 76, New York, 1914.) In dramatic writing, as in fiction, the modern Greek writers have for the most part owed far too much to French models; but the comedy Βαβυλωνία, published in 1836 by D. K. Byzantios (a painter by profession), in which a comical entanglement is caused by the failure of the several characters rightly to understand one another's dialect, and which contains a good deal of clever satire on the confused state of the modern tongue, should not be passed over. Worthy of mention, too, are the comedies of Angelos Vlakhos (1871). A prominent place in modern Greek fiction is held by Dimitrios Bikelas, born at Hermopolis in Syra in 1835. His Διηγήματα (Stories) give vivid glimpses of the life of the Ægean Islands. They have been gracefully translated into English (from the French edition) by Opdycke as *Tales from the Ægean* (Chicago, 1894). A brief but vivid picture of western Greece is presented in Bikelas' letters to a friend, Ἀπὸ Νικοπόλεως εἰς Ὀλυμπίαν (From Nicopolis to Olympia), which have also appeared in a French version. Here may be mentioned as other important modern Greek historical works the elder Tri-

coupis' *History of the Greek Revolution* and K. Paparrhegopoulos' *History of the Greek People*. (See TRIKOUPIS, SPIRIDON.) An historical novelist, as well as a literary critic of keen taste and sound judgment, is Emmanuel D. Rhoides, author of Πάπισσα Ἰωάννα (Pope Joan), a Rabelaisian historical satire published in 1867. An ardent champion of the popular language was Alexander Pallis (q.v.). Ordinary Greek journalism, generally of a very inferior sort, hardly falls, for the most part, within the scope of a survey of modern Greek literature, but mention should be made of the Ἑστία, an excellent literary journal published at Athens. (See again Garnett, pp. 74–77.) In scholarship the Greeks have accomplished much, notably in archæology and philology. (See Garnett, pp. 77–79.) The National University, founded under Otho, first King of the Greeks, has in its faculties men of international fame. Among these is the greatest living native scholar in later Greek, Hatzidakes. Constantine Kontos, who taught for many years at the university, was closely associated with the Dutch philologists, especially Cobet. The Λόγιος Ἑρμῆς, in the composition of which he was assisted by Cobet and Badham, the Γλωσσικαὶ Παρατηρήσεις (aiming at the purification of the modern written language), and numerous contributions to the learned periodical Ἀθηνᾶ are monuments of Kontos's great scholarship. Modern Greek prose writers have, in the main, adopted the literary rather than the popular Greek use of language and so are of less concern here.

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ROMAN, rō′măn, or **ROMANU.** A town of Rumania, capital of the department of the same name, 35 miles west by south of Jassy, near the confluence of the Moldava and Sereth rivers (Map: Balkan Peninsula, F 1). The bishopric of Roman dates from the early fifth century. Pop., 1899, 14,019.

ROMAN, rô-mäN′, *Fr. pron.* rô′mäN′, ANDRÉ (or ANDREW) BIENVENU (1795–1866). An American political leader. He was born in Opelousas Parish, La., and was the son of a French Creole sugar planter. He graduated at St. Mary's College, Baltimore, in 1815 and soon afterward settled on a sugar plantation in St. James Parish, La. He was long a member of the Lower House of the State Legislature and its Speaker for four terms. While Governor of the State (1831–35) he secured the passage of various important measures, and when again Governor (1839–43) did much to prevent the repudiation of the State debt. In 1845 and again in 1852 he helped to draw up new State constitutions. In politics a Whig, he was strongly opposed to secession, but as a delegate to the Secession Convention of 1861 he acquiesced in the withdrawal of the State from the Union. Later in the same year he was one of the three commissioners sent to Washington by the Confederate provisional government to negotiate peaceful separation. He was too infirm to take an active part in the conflict that followed, but was a strong supporter of the Confederacy.

ROMAN ALUM. See ROCHE.

ROMAN ART. Although the Romans affected to despise the practice of the arts and displayed little artistic taste in their earlier history, they developed, nevertheless, a distinctly national art under the late Republic and the Empire, largely by the hand of artists of Greek race. It was during and after the reign of Augustus that the colossal undertakings of the Imperial period reached the unity of a national style throughout the Empire. The century and a half that followed was the golden age. The decay set in before the time of Septimius Severus and was complete in the time of Constantine except in point of practical constructive ability.

ARCHITECTURE

Pre-Roman. Central and southern Italy abound in ruins of elaborately fortified cities antedating 500 B.C., often more imposing and complete than the ruins of Mycenæ or Tiryns, e.g., Norba, Alatri, and Segni. The earliest temples (seventh century) remotely resembled the Greek in having a cella and portico and in the use of a primitive and clumsy quasi-Doric order, the Tuscan; but they were built chiefly of wood, with terra-cotta ornaments, fragments of which have been found on many sites, as at Satricum, Alatri, and Falerii. In Tuscany and parts of Umbria peopled by the Etruscan race architecture and decoration were further advanced, though the temples were mainly of the type just described, with terra-cotta sculptures, even in Rome almost to the time of the Empire (temple of Jupiter Capitolinus). Underground domes and vaults abound. Especially noticeable are the tombs at Tarquinii, Cære, Clusium (Chiusi), Perugia, and other sites, of elaborate design and sumptuous interior decoration, often representing the manners and customs of daily life. It is to the Etruscans that Roman architecture owes its arches and vaults.

Roman Architecture. Under the Republic the Romans employed Greeks and their pupils to put up their first stone and marble temples of Tuscan, Doric, Ionic, and Corinthian orders in place of the earlier Etruscan temples of wood and terra cotta. The aqueducts that

dotted the Roman Campagna were the most impressive of the works of republican Rome. The old Tabularium on the Capitol, the only remaining civil building of the Republic, shows how the Romans had already learned to combine their native style of arcades with the Greek orders. In three stories of arched openings each arch is flanked by engaged half columns supporting an entablature at each story level. The theatre of Marcellus, the Coliseum, the Basilica, and many other buildings were erected after this plan, using the Greek orders as a decorative adjunct to the Roman arched and vaulted constructions. The use of a species of coarse concrete (q.v.), which became general in the reign of Augustus, enabled architects to raise domes and vaults far larger than would have been possible with stone. Internal spaciousness and loftiness constituted a new artistic resource, which the world owes to the Romans.

The temples were built on various plans, the most common having a high basement or podium and short cella with deep porch; they were often barrel-vaulted and without a peristyle, the flanks and rear being adorned with engaged columns (Maison Carrée at Nîmes; temples of Fortuna Virilis and of Faustina at Rome). Some were round (temple of Vesta, with encircling colonnade; Pantheon with rectangular porch). Later temples were of colossal size, like the double temple of Venus and Rome, and the temples at Baalbek and Palmyra. Upon these temples the Romans carried purely ornamental decoration to a far higher degree of magnificence than the Greeks, as in the temples of Baalbek and those of Castor and of Faustina in Rome. They used the Corinthian in place of the plainer Doric and Ionic orders, and adorned the interiors of their basilicas, baths, and palaces with incrustations of marble and mosaics in a great variety of colors.

But although the Pantheon (q.v.) is one of the grandest structures extant, it was in their civic buildings that the Romans especially excelled—in their basilicas, vast halls, sometimes open, sometimes roofed or vaulted, for all sorts of public assemblies; in their fora, their miles of colonnades affording sheltered passage through the streets, and in their colossal public baths (e.g., of Caracalla or of Diocletian), which could accommodate many thousands of bathers, and whose courts, exedras, and vaulted halls, the latter of colossal size, were adorned internally in the most sumptuous manner with marble pavements and incrustations, mosaic, and delicate stucco relief in color. The forum of Trajan, with its colossal memorial column, arch of triumph, basilica, and temple, was a stupendous aggregation of architectural splendor. The Roman triumphal arches (see ARCH, TRIUMPHAL) and columns have set the type for all subsequent works of this kind, and Roman sepulchral art was also remarkably successful, especially in tombs of moderate size.

In remote provinces the Roman army was employed in the erection of buildings and even entire cities, skilled designers being attached to each legion. New cities arose in Syria and Africa, with their amphitheatres, theatres, baths, and arches. Southern France became a great centre of Roman culture. The Pont du Gard, the amphitheatre and theatre at Arles, the arch and monument at Saint Rémy, the theatre at Orange, the gates, temple, baths, and amphitheatre at Nîmes, are impressive works of the golden age, and are better preserved than the monuments of Rome itself. In Spain and in Rhenish Germany are important remains, like the Alcántara bridge and the Porta Nigra at Treves.

In Italy itself, notwithstanding the wholesale destruction of the Renaissance, many works of first-class importance remain outside of Rome. In northern and central Italy we may mention only the amphitheatre at Verona, the temple of Minerva at Assisi, the stupendous ruins of the villa of Hadrian at Tivoli. The south of Italy, especially the region about Naples, has the most interesting monuments outside of Rome, such as the great amphitheatres at Capua, Puteoli, and Casinum (Cassino), the noble arch of Trajan at Benevento, and finally the unrivaled ruins at Herculaneum and Pompeii. For both public and domestic Roman architecture of the best period, Pompeii is the great storehouse, because it presents a complete provincial city. See POMPEII.

In north Africa the French have unearthed a series of ruined Roman cities of great architectural interest. The cities of Thysdrus, Suffetula, Lambessa, and Timgad, nearly all built between about 130 and 250 A.D., abound in materials for study. The Roman remains in Syria may be divided into two classes—the reign of old Syro-Hellenic culture from the coast to the cities of Damascus, Antioch, and Edessa, and the inland region along the desert line, where the Romans were first to establish cities. (See PALMYRA.) It is the desert cities that have kept their ruins most intact—Petra, Palmyra, Baalbek (Heliopolis), Jerash (Gerasa), and many smaller towns. The colonnades and temples at Palmyra of late date are among the most colossal of Roman ruins. In Asia Minor the largest temple was that of Hadrian at Cyzicus; all the theatres (except that of Priene) are Roman, and that at Aspendus is the best preserved anywhere. Roman work is often interwoven with Greek, as at Pergamum, Magnesia, Aizani, Ephesus.

The buildings of Rome itself are too well known to require enumeration. Constantinople was the field where the latest stage of Roman architecture was best displayed, while Rome itself was in decadence. Its memorial columns of Arcadius and Theodosius, its hippodrome, forum, basilicas, theatres, aqueducts, walls, were the greatest products of the fourth century, beginning with Constantine. Their inferiority in style as well as construction is marked.

Roman architecture remained by no means stationary during the four centuries of the Empire. In constructive skill, composition, and the union of sculpture with architecture there was almost continuous progress from Augustus to Trajan, when Roman art reached its perfection. Then began, with Hadrian, a decline in taste and in constructive refinement. But in bold, effective composition and daring construction there was, if anything, an advance: witness the baths of Diocletian and the basilica of Constantine. Reviewing Roman architecture as a whole, the world is more indebted to it than even to Greece for fertility and variety of invention.

SCULPTURE AND PAINTING

The development of sculpture in Rome was relatively late. The chief incentive of Greek sculpture, the decoration of temples, was originally absent at Rome, and sculpture for a long

time found its principal channel in portrait statues, required by the ancestor worship and self-glorification of Roman citizens. Mythological subjects were not much represented until the reign of Augustus, but here Greek originals were merely copied. At first bronze was the favorite material, and sculpture in the round the only form practiced, but with the advent of Greek influences marble became more common. The great architectural works of the Imperial period, the amphitheatres, baths, basilicas, bridges, etc., called for their decoration with innumerable statues. Specially Roman are those fine combinations of architecture, the triumphal arches, commemorative columns, and the like, in which the sculpture relief received a development which made it, next to portraiture, the most characteristic form of Roman art.

Etruscan Epoch. As in the architecture the first influences in Roman sculpture and painting were Etruscan. (See ETRURIA, *Archæology and Art.*) Recent discoveries under the Lapis Niger in the Roman Forum (1899–1900) show that as early as the sixth century B.C. statuary and other objects of art were imported from Etruria. There are hazy traditions also of Greek artists in Rome, as Damophilos and Gorgasos, who decorated the temple of Ceres in 493 B.C., but until the end of the third century the chief influence remained Etruscan. The innumerable bronze statues with which the Forum was adorned were practically all of Etruscan origin.

The Greek Epoch. The conquest of the Hellenic world opened the eyes of the Romans to the charm of Greek sculpture and painting, and Rome soon became a veritable museum of masterpieces torn from Greek temples and palaces. The decorations of the temple of Honor and Virtue (207 B.C.) were carried off from Syracuse by Marcellus; those of the temple of Fortune (173 B.C.) were seized from that of Juno Lacinia on a promontory between Crotona and Sybaris. Fulvius Nobilior built a temple to Hercules and the muses as a resting place for their statues captured in the Ætolian War, and when the rude Mummius took Corinth (146 B.C.) he gave his soldiers a free hand to sack the city of its art treasures. Greek artists of the later school flocked to Rome—Pasiteles, Stephanus, Menelaus, Arcesilaus—and their works found admirers as readily as those of Myron and Praxiteles. In fact, the popular taste called rather for the vigorous and the sensual than the ideal, and loved the Pergamene school, the Medici Venus, and the Tortured Marsyas, which the ateliers of the day turned out in great numbers. The very large majority of ancient statues that fill most museums, chiefly copies of more ancient masterpieces, are works of this and the following periods.

Græco-Roman Epoch. The first two centuries of the Empire continued without limit the reproduction of Greek artistic types; but from the end of the Republic there grew up, almost unperceived, a new spirit, which may be called distinctively Roman, and which showed itself especially in realistic portraiture and in historical sculptured reliefs. The Greek conception of a portrait statue or bust was largely ideal, as in the Alexander heads of Lysippus. Roman portraiture was a development of Etruscan art and under the Republic was represented by the *imagines maiorum*, wax masks, which hung in the atria of noble houses. The "Young Augustus" and the armored statue of the same Emperor from Prima Porta represent Roman portraiture in its most perfect form, still influenced by Greek idealism. In the "Cæcilius Jucundus" from Pompeii and in the busts of Nero and Caracalla we have the Roman realism which never hesitated to reproduce personal peculiarities however revolting. The realistic tendency shows itself also in reliefs—at first feebly, as in the noble sculptures from the "Ara Pacis" of Augustus; then more forcibly in the arch of Titus and the columns of Trajan and Marcus Aurelius. Hadrian's travels in Greece and Egypt caused a momentary idealizing and archaizing reaction, shown in the noble melancholy of the Antinous busts and in the copies of old Egyptian motives. With the fall of the Antonine dynasty real creative art began to deteriorate.

The course of development in painting was similar to that of sculpture. It is impossible to say whether Gorgasos and Damophilos had any influence on contemporary painters. We indeed know from literature that temples were decorated with frescoes and that pictures of the victories of the Roman generals were borne in their triumphal processions. Even the names of painters of Roman birth have been transmitted, the most celebrated being Fabius Pictor (c.300 B.C.) and the decorative painter Ludius (Tadius, Studius), a contemporary of Augustus. All were essentially Greek in technique and methods, as is evident from the few surviving works, which follow the forms of the Hellenistic period. Only mural decorations survive, but we know that panel painting also was largely practiced. The principal of these works are noticed in the appropriate place in the history of Greek painting (see GREEK ART), but in many of the surviving examples there is a trend towards realism which can only be attributed to Roman influence. Such is the case with the famous "Aldobrandini Marriage" and in the delicate garden scenes, with birds and flowers, in Livia's villa *ad Gallinas;* while Pompeian frescoes show the same tendencies under Alexandrian influence.

Decline. There is little to be said of this period. Previous tendencies continued, but the technique suffered a gradual decadence which seems almost incredible. Colored marbles and even materials most difficult to work, such as granite and porphyry, were used for sculptures, the hardship involved in the workmanship seeming to compensate for the crudity of the art. When Constantine built his arch he did not hesitate to cover it with sculptures stripped from the earlier arch of Trajan—fine specimens of Roman realistic art which stand out in strong contrast with the later reliefs, puerile in conception and execution, that were set among them. A few examples of early Christian art are conspicuous in this period of æsthetic decay, such as the charming "Good Shepherds" of the Lateran Museum. The same poverty of invention and decline of technique is evident in the paintings of the epoch, from which the Christian paintings of the catacombs do not essentially differ. And with the barbarian conquest of Italy all classical art comes to a sudden end. (See BYZANTINE ART; CHRISTIAN ART.) The Romans attained a considerable degree of excellence in certain of the minor arts, especially in objects of luxury. See EARRING; GEMS; GLASS; GREEK ART; ILLUMINATED MANUSCRIPTS; JEWELRY; RING.

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ROMAN CANDLE. See PYROTECHNY.

ROMAN CATHOLIC CHURCH. The Roman Catholic church may be considered, (1) as a theology, embracing the history of the origin and growth of its doctrines and liturgical practices: this is its dogmatic history and as such is treated in numerous articles of this Encyclopædia; (2) as a spiritual force accomplishing in every nation where its doctrines have been preached a high moral culture and civilization: this is its history as a divinely founded institution for the salvation of humanity and will be found treated under such articles as ART; EDUCATION; PAPACY; (3) as a polity, viz., the history of its influence as a world power and its adaptability to every age, condition, and environment: this is its political history and will be found under such articles as BISHOP; CHURCH; TEMPORAL POWER; ETC. To give an accurate description of this threefold life of the church, as evidenced in its external and internal relations with the world, the present article, which is of an encyclopædic nature, should be a blending of these three aspects. A simple definition of the Roman Catholic church would be: that portion of Christendom which acknowledges the Pope or Bishop of Rome as its head and which considers such adherence to this definite and visible centre of unity as absolutely essential to membership in its ranks. It claims to be the only legitimate inheritor by an unbroken tradition of 20 centuries of the commission and powers conferred by Christ upon the Apostles. Numerous articles throughout the Encyclopædia give abundant details as to the doctrine and discipline of this church in its relation to the historic development of Christianity.

The article PAPACY has already traced, in as much detail as space would allow, the history of the apostolic see of Rome down to the Council of Trent. The historical survey may best be divided into two periods. The first of these really begins before Trent, with the assembly by the Emperor Sigismund of the Council of Basel, which initiated a fresh attack on the Pope's authority, and may thus be taken to extend from 1431 to 1789, while the second reaches from the French Revolution to the present day. The first period thus embraces the break-up of the European family of nations, like-minded in religious belief, by the outburst of the Protestant revolt, to counteract which the Council of Trent was assembled. It includes the extension of the faith to India, to Japan, and to the New World recently discovered, and ends with the great overthrow of the European comity of nations at the outbreak of the French Revolution. After the Great Schism (see SCHISM, WESTERN) the church passed out of the period of ancient and mediæval into the light of modern history, and fresh fields wherein to exercise her activity. Many things contributed to make the beginning of the sixteenth century a favorable time for a general assault upon her doctrine and discipline. On the one hand the ranks of the clergy had hardly yet recovered from the distressing effects of the Black Death. Men's minds were still shaken by the 70 years' exile of the papacy to Avignon and the succeeding schism. They had suffered for centuries from the interference of princes in the spiritual affairs of the dioceses and from the constant hindrance placed upon their communication with the central ecclesiastical authority at Rome. Lastly, all the countries of Europe were largely infected with teaching subversive of ecclesiastical authority, and were witnesses to the relaxation of discipline, neglect of the sacraments, deadness of religious life, and the luxury caused by the adoption (under the influence of the Renaissance) of heathen models among so many of the leading clergy and teachers. The details of the great revolt will be found under REFORMATION; while in the article COUNTER-REFORMATION some account will be found of the results which followed the vigorous putting into effect of the decrees of the Council of Trent. (See TRENT, COUNCIL OF.) Shortly before the time when the religious troubles in Germany caused the loss of so many members of the Catholic church in Europe, the discoveries of the Portuguese in India and of the Spaniards in America had opened up fruitful missionary fields from which a host of new Catholics were recruited. After the missions the most important work of the church during the sixteenth century was the revival of education. This, like much of the missionary work, was due in

a great measure to the Jesuits, who established colleges in all the countries which remained untouched by the Reformation and also in parts of Germany. Other teaching orders, especially of women, took rise or were revived in spirit at the end of this century, and for the next 200 years nearly monopolized feminine education.

New elements were introduced into the political relations of the church after the Reformation. The final loss of England, Scotland, and Scandinavia; the consolidation of the non-Catholic powers; the mercantile predominance acquired by Holland, while the power of Venice and Genoa was waning; the colonial enterprise of Protestant England, at the expense of the interests of Spain and Portugal; the growth of a mighty empire in the East under the Czars, which was ultimately to involve the destruction of the Catholic Kingdom of Poland—all these causes tended to restrict the influence of the Roman see. Austria and Spain assumed the rôle of defenders of the Catholic church. France, after the crisis of the religious wars and the submission of Henry IV, became alternately the principal support of the Catholic cause and the greatest menace to the Pope's claims of jurisdiction. A succession of sagacious pontiffs were aided in their work by a large number of saintly individuals, whose lives drew men into the church and confirmed the wavering.

During the seventeenth century the same forces were at work within the church. The number of students in Jesuit colleges alone increased before 1700 to nearly 200,000. Foreign missions prospered wonderfully in China, India, and Japan. The Reductions of Paraguay offered a shining example of the successful organization of a Christian community among recent converts from heathen barbarism.

In Europe, however, the stubborn spirit of Jansenism (q.v.) for almost a hundred years threatened the peace of the church. Though it was ultimately suppressed it left its mark upon the church of France in the spirit of Gallicanism, which implies nationalism in ecclesiastical organization and discipline, as opposed to the system of unification of all Christian peoples round the one centre. (See GALLICAN CHURCH.) In central Europe the nations who had separated themselves from this unity were daily growing in material prosperity, and during the seventeenth and eighteenth centuries the Spanish and Portuguese missions in America, Africa, and Asia were in a great measure replaced by Dutch Calvinists and English Protestants. Prussia rose to be a great Protestant state by the side of Catholic Austria. The long minority of Louis XV of France, under the regency of the infidel Duke of Orléans, opened the doors to the spread of a literature which, under the general name of the Encyclopædic school, treated the most vital doctrines of Christianity as open questions. With the distinct object of eradicating Christian doctrines, the secret societies, which had obtained increasing power in all the courts of Europe, began by singling out for attack the Society of Jesus, whose power, both political and religious, had grown to such an alarming extent during the two centuries that had passed and in which vested interests recognized the foremost champions of the liberties of the holy see and of the old faith. The war, which began by the expulsion of the Jesuits from Portugal and Brazil by Pombal, was carried on by the Bourbon kings of France, Spain, and Naples, who brought such pressure to bear on Pope Clement XIV as to force him in 1773 to decree the suppression of the order. The removal of the most prominent exponents of religious education had a marked effect on the rising generation, and the attack on the other religious orders, and eventually on the person of the Pope himself, could not be long delayed. The hostility to definite and dogmatic religious organizations which was shown in many quarters during the last half of the eighteenth century found expression especially in the hostile attitude of the Emperor Joseph II and culminated in the decrees of the French revolutionary Assembly. Since then, even in nominally Catholic states, the action of European governments has generally been characterized by complete disregard of the traditional principles which had for many centuries influenced their conduct. Personal violence was offered to the Pope by Napoleon, and the nineteenth century was marked by the loss of the territory which had been subjected to papal temporal jurisdiction, until in 1870 the last vestige of it, outside of the walls of the Vatican, disappeared.

The inherent vitality of the church has enabled it, in the concluding period, to gain in one direction what it lost in another. At the close of the eighteenth century, when Pius VI died in captivity, those outside the church spoke of the end of the papacy. It was not until after the fall of Napoleon that Pius VII was able to carry on his sacred duties. One of his acts was the restoration of the Jesuits, and, as before, they spread rapidly throughout the world, until again many of the principal Catholic schools came under their charge. Their educational activity was paralleled to a great extent by the modern pedagogical methods of the Brothers of the Christian Schools founded by St. Jean Baptiste de la Salle. In France the end of the first quarter of the century saw a reaction against the rationalism of the eighteenth, and, under the teachings of many zealous missionaries, the mass of the people returned to the faith.

In England the famous Oxford movement (q.v.) called the attention of the English-speaking world to the church's claims, and the removal of the legal disabilities under which her members had rested for 300 years was the prelude to the restoration of an English hierarchy in 1850. Throughout the century there was a marked and progressive change of attitude on the part of English-speaking people towards the church—a gradual disappearance of the bitter prejudices which had been entertained. In Germany the Catholic revival has been very marked, and the attempt at repression by the Prussian government in the so-called May Laws (see KULTURKAMPF) brought about a political union of friends of the church which gave them, under the name of the Centre party, the balance of power and a prominent position before the world. An important event in the chapter of the relations between church and state occurred in 1905, when the French government, after several years of ever-increasing anticlerical aggression, repudiated the concordat made by Pius VII and Napoleon in 1801. (See FRANCE.) While governments have frequently attempted a hostile or oppressive attitude, the work of the church has continued to grow, especially where absolute religious freedom prevails.

While in many indifferent or purely administrative matters she has adapted herself to the changing conditions of modern life, in regard to the great fundamental verities the church admits no possibility of change. Pius IX, for a time dethroned and driven into exile by the revolutionary forces which swept over Europe in 1848, only six years later defined as a dogma of the faith the belief of centuries in the immaculate conception of the Blessed Virgin Mary; in 1864 he promulgated a condemnation of what were considered, from the point of view of the church, the false doctrines held throughout European society, in a document of no uncertain sound, the Syllabus of Errors (see SYLLABUS ERRORUM); and in 1869 convoked a general council to deliberate on matters of internal discipline. Hardly had the sessions begun when all predetermined matters of discussion were set aside to consider fully and eventually to define the doctrine of papal infallibility. (See INFALLIBILITY; VATICAN, COUNCIL OF THE.) This doctrine, carefully limited as it is, crystallizes in practical form the belief in a living voice which shall speak with authority on what men need to know for the general guidance of their life here and hereafter. On the burning question of the inspiration of the Bible the Roman Catholic church, while always declaring the Scriptures to be in a special and particular sense the word of God, yet has never committed herself to any precise theory of the manner of inspiration, and is therefore able to meet without alarm the questions raised by the so-called higher criticism. A special commission was appointed by Leo XIII in 1903 to promote advanced biblical studies, taking into account all the material provided by modern scientific criticism. Pius X, who ascended the papal throne in 1903, brought about certain reforms of lasting benefit to the church. His *Motu proprio* on church music (1903) restored the liturgical services of the church to their early purity of design. His new codification of canon law (1904), which in 1915 was in process of completion, will bring about a universal juridic aspect to the Catholic church in the world. His decree *Ne temere* (1907) accomplished a general application of the Tridentine Decrees on marriage, and the already famous encyclical *Pascendi gregis* (1907) with its accompanying decree *Lamentabile* awoke the church to the dangerous influx of modernistic ideas. Benedict XV, who succeeded Pius X (1914), was born at Genoa, Nov. 21, 1854. He became Archbishop of Bologna, Dec. 18, 1907, and was created Cardinal, May 25, 1914, three months before his election to the papacy.

The hierarchy of the church, with the Pope at its head, includes as his closest advisers the College of Cardinals (see CARDINAL). According to the *Annuario Pontificio* for 1915 there are 14 patriarchal sees, 8 belonging to the Latin rite and 6 to the Oriental rite, viz., to those Eastern countries which, although under the jurisdiction of Rome, enjoy their own peculiar liturgical worship. There are 178 archbishops of the Latin rite and 19 of the Oriental. The Latin archbishops have 847 bishops in the provinces besides 84 who are immediately subject to the holy see, and there are 49 bishops of the Oriental rite. These figures do not include over 300 titular bishops (q.v.), who are employed as coadjutors or in missionary work. The practical administration in detail is largely carried on by the Roman congregations, especially that of the Propaganda. (See MISSIONS.) There are 13 distinct Sacred Congregations presided over by the Pope or a cardinal for the management of the spiritual and temporal affairs of the church throughout the world. There are 3 Sacred Tribunals for the dispensing of justice in spiritual matters and 5 officers for the transacting of the more important temporal affairs of the papacy. There are 24 national colleges at Rome, the American College for the higher training of specially selected American candidates for the priesthood having been founded Dec. 8, 1859. It is obviously difficult to give any precise figures for the total number of adherents of this church. The last publication of this nature, the *Atlas Hierarchicus* of Streit (1913), gives the latest figures up to that time. He estimates the Catholic population of Europe at 186,196,342; of America at 86,855,097; of Asia and Africa at 13,279,811; and of Australia at 1,313,610—making a grand total of 287,644,860.

Curia Romana. The Roman Curia is the cabinet of the Pope, the departments of which aid him in the government of the Universal Church, and is made up of (*a*) the Roman Congregations and (*b*) the Offices and Tribunals of the Curia.

The *Roman Congregations* are the most important branch. Its organization began some time in the reign of Sixtus V (1585–90) and was established as it exists at present by Pius X in 1908. All decisions of these bodies must receive papal approval. In this particular division of curial offices there are:

(1) The *Congregation of the Holy Office*, whose function is to remove all danger springing from false teaching. The prefecture of this body is reserved to the pontiff himself. The under officers are chiefly Dominicans, who examine the orthodoxy of all propositions relating to faith and morals.

(2) The *Congregation of the Consistory*, which has charge of the establishment of new dioceses, collegiate and cathedral chapters, election of bishops and apostolic administrators. Like the Congregation of the Holy Office, its sessions are secret and the members cardinals.

(3) The *Congregation of the Sacraments*, which deals with ecclesiastical and chiefly sacramental discipline, with matrimonial dispensations and matters relative to the other remaining sacraments, and the mass. Its prefects and other members are cardinals.

(4) The *Congregation of the Council* governs the interpretation and execution of the decrees of the Council of Trent, which implies the application of all the branches of canon law. It has jurisdiction over diocesan affairs in regard to both clergy and laity.

(5) The *Congregation of Religious*, of which the major officials are cardinals, supervises matters connected with the different religious orders.

(6) The *Congregation of Propaganda* controls spiritual matters in any part of the world where Oriental rites are followed. Many countries formerly under its direction are now independent of it. The history of this congregation would be the history of foreign missions the world over.

(7) The *Congregation of the Index*, as its name indicates, censures and condemns books which it judges dangerous to faith or morals.

It began to take definite shape at the epoch of the invention of printing.

(8) The *Congregation of Rites*, (9) the *Congregation of Extraordinary Ecclesiastical Affairs*, (10) the *Congregation of Ceremonies*, (11) the *Congregation of Studies*, (12) the *Congregation of Loreto*, and (13) the *Congregation of the Fabric of St. Peter's* do work which is clearly enough explained by their titles.

Besides these congregations there are in the Roman Curia other branches. The *Tribunal of the Sacred Penitentiaria* administers mainly in matters of conscience, and is authorized to grant absolutions, dispensations, commutations, in fact spiritual graces of all kinds. It is pledged to the strictest secrecy. The *Tribunal of the Sacra Romana Rota* takes cognizance of all litigations ecclesiastical, which must come before the holy see whether criminal or otherwise. The *Apostolic Signatura* is a tribunal which decides in four kinds of cases, viz.: accusations of suspicions against an auditor of the Rota; accusations of violation of secret affairs by an auditor of the Rota; appeals against a sentence of the Rota; petitions for a nullification of a decision of the Rota. See ROTA.

ROMAN CATHOLIC CHURCH IN THE UNITED STATES

The earliest account of the Catholic church in America is the presence of Catholic priests in Greenland in the tenth century; the diocese of Gardar was established in 1112. The continuous and authentic history of the Roman Catholic church in the New World opens with the year 1494, when 12 priests accompanied Columbus to the new world. They were subject to the Spanish see of Seville until 1512, when the first American episcopal see of San Domingo was created. In 1522 another see was established at Santiago in Cuba, and the see of Mexico was added in 1530. From these latter sees were evangelized the Indians of the northeastern and southwestern territories of the present United States. The traces of their work may yet be studied in Florida, New Mexico, and California, where during the period from the middle of the sixteenth to the end of the eighteenth century Spanish missionaries, chiefly Franciscans, Dominicans, and Jesuits, established numerous Christian communities, dependent, however, on the authorities in Cuba and Mexico. In the same period French missionaries evangelized the savages of the St. Lawrence, Maine, northern New York, and the Mississippi. As early as 1634 Jesuit fathers were established in the originally Roman Catholic Colony of Maryland, and after 1681 Roman Catholics were tolerated by Penn and the Quakers in their Colony of Pennsylvania. From these latter centres derive the actual Roman Catholics of the United States. Until 1784 they were under the spiritual jurisdiction of the Vicar Apostolic of London, and their religious needs were ministered to by such rare missionaries as could be induced to cross the ocean.

The Revolution brought a change for the better. Religious and civil liberty, the civil disorders of Europe, the economical reverses of the Old World, the attractiveness of a new and untrammeled society, set in movement a huge immigration, of which a great percentage was Roman Catholic, mostly from Ireland. In 1790 the see of Baltimore was created, and John Carroll, a near relative of the signer of the Declaration of Independence, was made its first Bishop. There were then about 30,000 Catholics in the 13 colonies, more than one-half being in Maryland and some 7000 in Pennsylvania. By the year 1820 the Catholics had reached the figure of a quarter of a million, and in 1840 their number was calculated at about 1,000,000. The increase of immigration trebled that number in the next two decades, and in 1870 they were nearly 5,000,000.

The Roman Catholic church in the United States has had to face problems quite different from those that await her in Europe or the Orient. Her numbers are made up of many nationalities, chiefly European. Her chief domestic concern is the amalgamation of these various elements and the gradual formation of a homogeneous type. In 1900 quasi-official figures placed the total Catholic population at 10,129,677. But absolutely reliable figures are not attainable, for a variety of reasons. It is probable that the number is not far from 16,000,000, if we accept the decadal ratio of growth as established by the Catholic historian John Gilmary Shea. This population is very unevenly distributed, by far the greater part of it being found in the larger cities and industrial centres, though a rapidly increasing percentage is of native origin. From 1850 to 1900 about 4,000,000 people, nearly all Roman Catholics, emigrated from Ireland, the greater part of them to the United States. This great wave of immigration has long since fallen off; there came from Ireland in 1900 only 35,370. On the other hand, the immigration from Italy has steadily increased from 21,295 in 1886 to 100,135 in 1900, while again that from Germany has shrunk to small proportions. In about the same period, however, the immigration from Austria-Hungary, which is mainly Roman Catholic, rose from 56,199 in 1890 to 114,847 in 1900. The membership of the Roman Catholic church is, therefore, even yet notably affected by the rise and fall of the tide of European immigration. The principal events of general interest within the last half century are the Plenary Council of Baltimore (1884), the Catholic Congress (1889), the foundation of the Catholic University at Washington (1889), the establishment of the Apostolic Delegation at Washington (1893), and the publication of the *Catholic Encyclopedia* in 16 volumes (New York, 1907–14).

Administration. The Roman Catholic church in the United States is subject to the same central legislative and executive authority as all other national churches—the Bishop of Rome. He exercises therein a jurisdiction that is recognized as of divine origin, immediate, apostolic, and ordinary. This holds good not only in matters of doctrine, but also in matters of discipline; the Pope is the final court of appeal in all matters of a spiritual or religious character. In detail the papal authority is partly written, partly of daily application—interpretative, executive, legislative. The basis of government is the canon law (q.v.) as considerably modified by the Council of Trent and since then by the numerous decisions and interpretations of Roman Congregations, as well as by papal rescripts, and the special legislation for missionary countries and circumstances. Nevertheless there remains much in this code of laws, in the shape of principles and spirit,

which is unchanged and unchangeable, and therefore common to the Roman Catholic church in the United States with all other parts of Catholicism.

The church in the United States is divided into provinces and dioceses. Each province is presided over by an archbishop and thus forms an archdiocese. Besides the archdioceses there are 85 separate dioceses, with one vicariate (North Carolina) and one prefecture apostolic (Alaska). There is also one bishop for the Ruthenian Catholics of the United States (Philadelphia). Each diocesan bishop, however, is quite independent within his own territory. The archbishop presides over provincial synods, at meetings of his suffragan bishops, and exercises, in some well-defined cases, a certain authority of supervision. Each diocese, moreover, is provided with a chancery and the requisite officials to carry on the canonical government of the faithful. The dioceses are divided into parishes and missions, whose pastors are appointed by the bishop. The bishop is provided with a council of priests, called consulters, partly of his own selection, partly chosen by the diocesan clergy. This council, however, though it represents the cathedral chapter, has only a consultative character; its consent is not requisite to the validity of episcopal acts. It is the right and duty of the bishop to visit canonically all parishes and missions, see to the observance of the canons and other ecclesiastical legislations, and execute his own or superior judicial decisions. Where the bishop does not proceed by his own authority, as in many details that concern religious orders, he acts, since the Council of Trent, as delegate of the holy see. Within his diocese the creation, division, and reunion of parishes, the site, style, and cost of all churches, the contracting of debts for parochial purposes, the building and conducting of schools, convents, academies, the life and works of the clergy, diocesan and religious, and of the communities of women, are subject to the bishop.

Since the Third Plenary Council of Baltimore the nomination of episcopal candidates belongs to certain of the clergy of the diocese, under the supervision of the archbishop, and eventually of the bishops of the province. The diocesan consulters and the irremovable rectors of parishes in the vacant diocese select three names that are ticketed as most worthy, very worthy, and worthy of the office (*dignissimus, dignior, dignus*). These names are sent (since 1908) to the Consistorial Congregation, after a meeting of the archbishop and his suffragans, in which said names are either approved or rejected, in whole or in part. Reason for the latter action must be submitted to the Roman authorities, with whom lies the final choice.

The bishop must appoint a vicar-general, whose authority is ordinary, i.e., not dependent on restriction of the bishop, but specified in the canon law and ecclesiastical legislation. This official represents to the clergy the episcopal authority and has certain well-defined duties, rights, and attributes that go with the office and cease when he no longer holds it. Other officials, provided for partly in the canon law, partly by the legislation of national councils, hold their appointment from the bishop. Such are the clergymen to whom are assigned the official defense of marriages whose annulment is sought on canonical grounds, the prosecution of offenders against the church laws, the examination of candidates for admission to the diocese, the visitation of parochial schools. Of the consulters of the bishop one-half are named by himself, the other half are elected by all the diocesan clergy. This council must be renominated every three years. The time and place of its meetings and the subjects of its deliberations depend on the bishop, who is not bound canonically to accept its opinions, though he is held to create it and to consult with it.

Legislation. The particular legislation that emanates from the Roman Catholic episcopate of the United States as a whole arises from three sources—the national, provincial, and diocesan councils. The latter are now usually called synods. There have been three national (plenary) councils—all held at Baltimore, which see, by reason of its being the first in order of time, has a quasi-primatial character accorded to it by the holy see. These three national councils were held in 1829, 1866, and 1884. After approval by the Pope the decisions are made public and become the highest national ecclesiastical law and norm of administration. The effective membership of a national council is restricted to the bishops; certain ecclesiastical personages have an honorary right of assistance, but not of vote. Provincial councils are called at indefinite periods by the archbishop of each province, and the membership is confined to the suffragans of the same. The diocesan synod is called by the bishop of the diocese and is attended by the priests of the same. It presupposes all legislation that emanates from higher sources, both general and national, and legislates for local needs.

Statistics. With the exception of the population figures, the statistics of the Roman Catholic church in the United States are quite accurate. They are collected annually by the diocesan authorities, and are furnished to the *Official Catholic Directory*, published by P. J. Kennedy and Sons, printers to the holy apostolic see, New York; also to the Census Bureau, which includes them in its report. In 1915 the Roman Catholic hierarchy of the United States included 1 Papal Delegate, 3 cardinals, 14 archbishops, 102 bishops, and 21 abbots. The clergy numbered 18,994, of which total 14,008 were members of the different dioceses and 4986 belonged to religious orders. There were, in all, 14,961 places of public worship. Of these 9883 are classed as parish churches and 5078 as missionary churches. The reason for the distinction lies partly in the fact that all the parish churches have resident priests, partly in the frequency of use, size, and accessibility of the mission churches. The education of the clergy was provided for in 85 diocesan seminaries, with 6770 students. The religious orders had 87 novitiates, with 3112 students or candidates. The educational institutes were 1 pontifical university (Washington), 229 colleges for boys, and 680 academies and convents for girls. There were 5488 parochial schools, with an attendance of 1,456,206. The charitable institutions were 997 in number, exclusive of 284 orphan asylums that sheltered 45,742 children of both sexes. The Catholic population was estimated at 16,309,310.

Archdioceses. Baltimore (Md.), Boston (Mass.), Chicago (Ill.), Cincinnati (Ohio), Dubuque (Iowa), Milwaukee (Wis.), New Orleans (La.), New York (N. Y.), Oregon City

(Oreg.), Philadelphia (Pa.), St. Louis (Mo.), St. Paul (Minn.), San Francisco (Cal.), Santa Fe (N. Mex.).

Dioceses. Albany (N. Y.), Alexandria (La.), Alton (Ill.), Altoona (Pa.), Baker City (Oreg.), Belleville (Ill.), Bismarck (N. Dak.), Boise (Idaho), Brooklyn (N. Y.), Buffalo (N. Y.), Burlington (Vt.), Charleston (S. C.), Cheyenne (Wyo.), Cleveland (Ohio), Columbus (Ohio), Concordia (Kans.), Corpus Christi (Tex.), Covington (Ky.), Crookston (Minn.), Dallas (Tex.), Davenport (Iowa), Denver (Colo.), Des Moines (Iowa), Detroit (Mich.), Duluth (Minn.), El Paso (Tex.), Erie (Pa.), Fall River (Mass.), Fargo (N. Dak.), Fort Wayne (Ind.), Galveston (Tex.), Grand Rapids (Mich.), Great Falls (Mont.), Green Bay (Wis.), Harrisburg (Pa.), Hartford (Conn.), Helena (Mont.), Indianapolis (Ind.), Kansas City (Mo.), Kearney (Neb.), La Crosse (Wis.), Lead (S. Dak.), Leavenworth (Kans.), Lincoln (Neb.), Little Rock (Ark.), Louisville (Ky.), Manchester (N. H.), Marquette (Mich.), Mobile (Ala.), Monterey and Los Angeles (Cal.), Nashville (Tenn.), Natchez (Miss.), Newark (N. J.), Ogdensburg (N. Y.), Oklahoma (Okla.), Omaha (Neb.), Peoria (Ill.), Pittsburgh (Pa.), Portland (Me.), Providence (R. I.), Richmond (Va.), Rochester (N. Y.), Rockford (Ill.), Sacramento (Cal.), St. Augustine (Fla.), St. Cloud (Minn.), St. Joseph (Mo.), Salt Lake (Utah), San Antonio (Tex.), Savannah (Ga.), Scranton (Pa.), Seattle (Wash.), Sioux City (Iowa), Sioux Falls (S. Dak.), Spokane (Wash.), Springfield (Mass.), Superior (Wis.), Syracuse (N. Y.), Toledo (Ohio), Trenton (N. J.), Tucson (Ariz.), Wheeling (W. Va.), Wichita (Kans.), Wilmington (Del.), Winona (Minn.), Ruthenian Catholic Diocese.

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ROMAN CATHOLIC EMANCIPATION. After the Reformation, both in England and in Scotland, Roman Catholics were subjected to many penal regulations and restrictions. As late as 1780 the law of England made it felony in a foreign Roman Catholic priest and high treason in one who was a native of the Kingdom to teach the doctrines or perform divine service according to the rites of his church. Roman Catholics were debarred from acquiring land by purchase. Persons educated abroad in the Roman Catholic faith were declared incapable of succeeding to real property, and their estates were forfeited to the next Protestant heir. A son or other nearest relative being a Protestant was empowered to take possession of the estate of his Roman Catholic father or other kinsman during his life. A Roman Catholic was disqualified from undertaking the guardianship even of Roman Catholic children. Roman Catholics were excluded from the legal profession, and it was presumed that a Protestant lawyer who married a Roman Catholic had adopted the faith of his wife. It was a capital offense for a Roman Catholic priest to celebrate a marriage between a Protestant and a Roman Catholic. In 1780 Sir George Saville introduced a bill for the repeal of some of the most severe disqualifications in the case of such Roman Catholics as would submit to a proposed test, which included an oath of allegiance to the sovereign and abjuration of the Pretender. The bill, from the operation of which Scotland was exempted, eventually passed into law. In 1791 a bill was passed affording further relief to such Roman Catholics as would sign a protest against the temporal power of the Pope and his authority to release from civil obligations; and in the following year the most severely penal of the restrictions bearing on the Scottish Roman Catholics were removed without opposition.

Endeavors were made at the same time by the Irish Parliament to place Ireland on an equality in point of religious freedom with England. The agitation culminated in the Irish rebellion of 1798; the union of 1801 followed, which was partly carried by means of pledges, not redeemed, regarding the removal of the disabilities in question. Meantime in England Roman Catholics continued subject to many minor disabilities, which the above-mentioned acts failed to remove. In the early part of the

nineteenth century many measures were proposed for the removal of these disqualifications, and the agitation on the subject among the Roman Catholics themselves greatly increased, in 1824 assuming an organized shape by the formation of the Roman Catholic Association in Ireland. The Duke of Wellington, who for a long time felt great repugnance to admit the Roman Catholic claims, was at last brought to the conviction that the security of the Empire would be imperiled by further resisting them, and in 1829 a measure for Catholic emancipation was introduced by the Duke's ministry. The celebrated Roman Catholic Relief Bill was passed the same year. By this act an oath is substituted for the oaths of allegiance, supremacy, and abjuration, on taking which Roman Catholics may sit or vote in either House of Parliament and be admitted to most other offices from which they were before excluded. They, however, continue to be excluded from the offices of guardian and justice or regent of the United Kingdom, Lord Chancellor, Lord Keeper, or Lord Commissioner of the Great Seal of Great Britain or Ireland, and Lord High Commissioner to the General Assembly of the Church of Scotland. In 1871 the Roman Catholic oath was abolished and the declaration against transubstantiation.

ROMANCE (OF. *romans, romanz, roumans, roman, romant, roumant, romance*, from ML. *Romanice*, in Roman or Latin fashion, from Lat. *Romanicus*, from *Romanus*, Roman, from *Roma*, Rome). Originally anything written in one of the Romance languages; in the eleventh, twelfth, and thirteenth centuries, old French or old English stories of various kinds, at first in verse and later, some of them, in prose; in the fifteenth and sixteenth centuries, a story generally in prose dealing with the adventures of knights. From the French, which had taken it from the Spanish, the word "romance" came into English. The essentials of romance are a passion for the adventurous, the strange, and the marvelous, and a tendency to exaggerate the virtues and vices of human nature. European romance, in the larger application of the term, dates from the Greeks. It was a development from the epic. The *Iliad*, representing men and incidents as they were believed to be at the time of its composition, is an epic with romantic elements and episodes. But the *Odyssey*, depicting an imaginary voyage employed as the framework for a series of marvelous folk tales, is essentially a romance. This love of romance, so manifest among the earlier Greeks, reached its climax in the first centuries of the Christian era. In the article NOVEL is given a brief account of the fictions then current, in which the Sophists tried to outdo one another in imagining adventures that could not possibly happen in real life. But the same age produced the beautiful *Cupid and Psyche* of Apuleius (who, though he wrote in Latin, was Greek in spirit) and the *Hero and Leander* of Musæus, which has charmed a succession of English poets from Marlowe to Byron. The Greek stories began to find their way into western Europe as early as the twelfth century. Indeed, *Apollonius of Tyre* was translated into Anglo-Saxon from a Latin epitome of the original Greek, and after various renderings it was turned into a drama by Shakespeare in his *Pericles, Prince of Tyre*.

The mediæval verse romance was an offshoot of those epic narratives called *chansons de geste*, celebrating the victories of Charlemagne and other great leaders, usually over the Saracens. When the incidents which first gave occasion to the epic recital receded into the distant past, marvel was added to marvel. And when in the twelfth century the French trouvères assigned love as the prime motive for the adventures of the knight, the epic was transformed into the romance. From their original home in France the romances were diffused over western and northern Europe. Made for men and women of rank, often for the court, they were not recited, as were the earlier *chansons de geste*, by minstrels; they were rather designed to be read aloud in groups of lords and ladies or, like the modern novel, to be read in private. The mediæval romances gathered in cycles round great events and favorite heroes, as the siege of Troy, Charlemagne, and King Arthur. The Troy legend, derived from Latin sources, was treated in France by Benoit de Sainte-More in his *Roman de Troie* (late twelfth century), from which the great story of Troilus and Cresseide (Cressida) was afterward taken up by Boccaccio in Italy and by Chaucer in England, receiving dramatic form from Shakespeare. The legend of Charlemagne, telling of the destruction of the Emperor's rear guard by the Saracens in the passes of the Pyrenees, is extant in two principal forms —the *Chanson de Roland* (close of eleventh century) and the Latin romance of the pseudo-Turpin (about 1125). Later romancing on Charlemagne led to the legends known in their English dress as *The Sowdone of Babylone, Otuel, Sir Firumbras*, and the prose *Huon of Bordeaux*, which first make known to England Oberon, the king of the fairies in Shakespeare's *Midsummer Night's Dream*. Beautiful as many others may be, the mediæval romances that appeal most strongly to the English race are those celebrating the deeds of King Arthur and the knights of the round table, on which the French and Anglo-Norman poets built up a vast romantic structure in harmony with the ideals of chivalry. Reduced to prose, Arthurian romance was handed over to later times by Sir Thomas Malory in his *Morte d'Arthur* (1485). These cycles which have been described are only sections of an immense body of romance current in the Middle Ages.

The later romances in prose are more definitely connected with the history of the novel, under which head they are noticed. We may cite *Amadis de Gaula*, the flower of Spanish romance, Sir Philip Sidney's *Arcadia*, the historical romances of Sir Walter Scott, and the revival of adventure in Robert Louis Stevenson and his numerous followers. The legends of King Arthur have been adapted to the nineteenth century by Tennyson, Swinburne, and others; and a group of tales, Greek and mediæval, have been delightfully retold by William Morris in *The Earthly Paradise*.

See the articles on the Grail and on the romantic heroes, Arthur, Gawain, Guinevere, Guy of Warwick, Lancelot, Merlin, Perceval, and Tristram. For the relation of romance to the novel, see NOVEL. The revival of romance is discussed under the head ROMANTICISM. Consult also: Henry Morley (ed.), *Early Prose Romances* (London, 1889; new ed., with additions, by W. J. Thoms, ib., 1906); Gaston Paris, *La littérature française au moyen-âge* (Paris, 1890); W. P. Ker, *Epic and Romance* (London, 1897); G. E. B. Saintsbury, *The Flourishing of*

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ROMANCE. In music, a vocal composition in epic-lyrical style resembling in form the ballad. In recent times the term "romance" has been applied also to purely instrumental compositions of a romantic character the form of which is as elastic and indefinite as that of the instrumental ballad. In France a romance is merely a sentimental love song.

ROMANCE LANGUAGES. The languages sprung from Latin and bearing its impress strongly in vocabulary and grammar. In a rough way the Romance territory in Europe corresponds to what belonged to the ancient Roman Empire, i.e., approximately all of the territory west of a line drawn through Belgium from Gravelines to Eupen and thence to the Alps and the Adriatic. In the east, isolated from the rest, is Rumania. Colonists have also carried these forms of speech to other continents, and they are spoken in Canada, Mexico, Central and South America, and in various parts of Africa and Asia. It is usual to speak of seven or eight Romance languages, though such a division is not always scientifically accurate. These are Rumanian, Romansh (Rhetian, Ladin), Italian, French, Provençal, Spanish, and Portuguese, to which may be added Catalan, Franco-Provençal, Sardinian, and Dalmatian.

Though contemporary references show the existence of the *lingua romana* in the seventh century, Latin was still the literary language. The earliest known monuments in any Romance language are the Strassburg Oaths (842 A.D.). (See FRENCH LITERATURE.) There are a few other documents belonging to the ninth and tenth centuries, but extended literary works are not found before the eleventh. To the tenth century belong also the earliest monuments of Provençal, a poem on Boëthius and another on Holy Faith, as well as the Italian charts of Capua, while there is nothing in Spanish earlier than the twelfth century.

Between the classical Latin, therefore, and the earliest-written specimens of the Romance languages there is a great gap, which philologists attempt to bridge by reconstructing the forms of popular or late spoken Latin. The materials available for this task are inscriptions, dialogue in the old comedies, errors reprehended by Roman grammarians, specimens of early mediæval Latin, documents written by ignorant scribes, and, above all, the features of the Romance tongues themselves. However wide the gap which exists between the written documents in the two forms of speech, there is nevertheless not the least break in the continuity of the development from spoken Latin to the various modern Romance languages.

The Romanization of the West, so thoroughly accomplished, went on actively for about four centuries, though it is naturally impossible to fix accurate dates. Beginning in Italy itself with the subjection of non-Latin neighbors, it spread to Sicily in the third century B.C., a century later to the Mediterranean coast of Gaul and Spain, and to Gaul proper only about the beginning of the Christian era. During this period the Latin language itself naturally underwent changes, and the later colonists carried with them a speech differing appreciably from that of their forerunners. Furthermore, this spoken language was not the same as that written by the masters of classic literature. Each grade of society, each part of the country must have had its own linguistic peculiarities. Yet there seems to have been throughout the Roman dominions a remarkable uniformity both of grammatical forms and of vocabulary. On the other hand the pronunciation doubtless varied largely, according to the native races who learned the tongue of their conquerors, much as English differs in the mouths of the various inhabitants of the British dominions in Asia, Africa, and America.

Throughout the vast Roman Empire, then, besides the Latin of written books and formal speech, there existed a more careless diction of everyday life, used by the uncultured. It is frequently referred to as *sermo cottidianus*, *proletarius*, *rusticus*, *vulgaris*, or *militaris*. Although much uncertainty prevails in regard to the relations between the spoken and literary language, we may be sure that it was subject to comparatively rapid phonetic and grammatical change and that its vocabulary admitted words upon which the purist frowned. In the course of time the quantity and quality of the vowels were altered. Short vowels became open, while long ones were closed. Then short vowels in free syllables were lengthened, long checked vowels shortened. Certain unstressed vowels disappeared, and some final consonants, notably *m*, were dropped. Voiceless consonants between vowels became voiced and then were lost, while in other positions different consonants underwent a variety of transformations. From the conjugation of verbs the future and the passive are lost. The cases of nouns fall together into the nominative and accusative, the latter finally prevailing, and relations are largely expressed by prepositions. Vulgar words are often preferred to the more refined, as *caballus*, nag, instead of *equus*, horse; emphatic words to the more usual, as *manducare*, to chew, to devour, instead of *edere*, to eat; sometimes new forms merely replace the old, as *amicitas* for *amicitia*.

Though differences must have existed in the Latin spoken in the various parts of the Empire, the indigenous tongues nevertheless seem to have left upon the development of the *lingua romana* but faint traces of their influence. They probably had their effect in modifying pronunciation, though there is but little certain knowledge on this subject, and they also contributed a few words to the vocabulary. It is remarkable, however, how little can be traced even to so important a race as the Celts. In all the most significant linguistic elements the Romance languages are nothing but Latin following a normal evolution in an unbroken tradition.

The Teutonic invasions, though destroying the unity of the Roman Empire, failed to interrupt the linguistic development of Latin in

the provinces. By isolating the different communities, however, and cutting off free intercourse with Rome they doubtless gave an impetus to the separation of the various dialects. Moreover, they had some influence upon the pronunciation and contributed considerably to the vocabulary, particularly terms connected with war and government. Even before the barbarian conquest a number of such terms had been in use among the Romans, but the later additions are much more important and copious. In fact no other external influence upon the Romance languages can compare in importance with that of the German.

The loss of the sentiment of nationality led, in the sixth and seventh centuries, to the rise of the Romance nations and of the Romance languages. It was recognized that those speaking the *lingua romana* could not understand Latin, nor could one using Latin understand the various forms of the *lingua romana*. Moreover, French (*langue d'oïl*) was seen to be different from Provençal (*langue d'oc*), and Provençal from Italian and Spanish. In each country, indeed, a literature was developed in the vulgar tongue. At first every author wrote in his native dialect, but soon political and literary centres began to exercise a powerful influence, and the dialect of Paris or Florence or Castile came to be the official language, while the other dialects descended gradually to the rank of mere patois.

During all this development the literary Latin, the language of the Church and of learning, never ceased to affect the popular tongue. Borrowing went on without interruption, giving rise to learned terms which often exist side by side with popular terms developed from the same Latin word. These learned terms can be distinguished by their closer resemblance to the original, since they have not passed through the natural phonetic development. We have, e.g., from the Latin *causam*, in French the doublets *chose* and *cause* and in Italian *cosa* and *causa*. In borrowing from other sources than Latin, German has given most to French, and Arabic to Spanish, but every modern language contributes to the vocabulary of its neighbors.

The evolution of the Latin into the Romance languages can best be studied in the concrete case of one particular tongue such as French, Italian, or Spanish, but a few general remarks may be made. The Latin accent or stress usually remains on the syllable on which it was originally. Changes in the vowels are conditioned by the stress, by the fact of their being free or checked, by the influence of preceding and following sounds, both vowel and consonant, and by position, either initial or final, before or after accent. The changes in consonants are conditioned chiefly by their position, initial, intervocalic, or final, and by their combination with other consonants. In the Romance tongues the inflection of substantives has almost wholly disappeared, and there is but one case, almost always derived from the Latin accusative; the plural, at least in the written form, is distinguished from the singular; the neuter gender no longer exists. The personal pronouns have three or four cases and both stressed and unstressed forms. The definite article, lacking in Latin, has been developed out of the Latin *ille* and the indefinite article out of *unus*. The verbs commonly make a new future with *habco* preceded by the infinitive, as *cantare* + *habeo*, giving It. *canterò*, Sp. *cantaré*, Fr. *chanterai*, I have to sing, I shall sing. The new passive is made by joining a past participle to some form of *esse*, to be, or the active voice of the verb with a reflexive pronoun. New perfect tenses have also been made with the perfect participle preceded by *habeo* or *sum*. A considerable array of suffixes has been developed with which new words can be built from various material.

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ROMANCE LITERATURES. The literatures of the various Romance languages. See FRENCH LITERATURE; ITALIAN LITERATURE; NORMAN-FRENCH; PORTUGUESE LITERATURE; PROVENÇAL LITERATURE; ROMANCE LANGUAGES; RUMANIAN LANGUAGE AND LITERATURE; SPANISH LITERATURE.

ROMAN DE LA ROSE, rō'mäN' de là rōz

(Fr., Romance of the Rose). A famous French poetico-satirical allegory of the thirteenth century. The work, which is in octosyllabic verse and which is over 23,000 lines long, consists of two distinct parts, the first of which, in 4670 verses, was composed by Guillaume de Lorris (q.v.) about 1230. It is related as a dream and celebrates the trials and triumphs of love. The author, called Loving (Amant), in early spring enters a beautiful garden where there is a rosebud which he feels impelled to pick. The god of love, who has followed him thither, pierces him with five arrows, each of which increases his desire. After various adventures he obtains from Welcome (Bel-accueil) the permission to kiss the rose, but Jealousy comes up, surrounds the rose with a wall, and locks up Welcome in a tower. Loving, deprived of the sight of the rose, is overcome with sorrow. Though commonplace in itself, this story is embellished by a great number of poetic details and by the most graceful and vivid descriptions. The style, too, is picturesque and refined. For some unknown reason (some say the death of Guillaume) the poem was interrupted here and only after 40 years was taken up and completed in almost 20,000 verses by Jean de Meung (q.v.). The latter, of a very original and radical turn of mind, has been called the Voltaire of his age. He conceived the singular notion of supplanting Guillaume's *ars amatoria* by an elaborate treatise on the scientific and political questions of his age. Loving is accosted by Reason, who in a long argument endeavors to make him leave the service of Love. But at this point Friendship steps in and urges him to besiege the tower. Love also promises his aid and assembles all his forces. The action is here retarded by a long interview of Nature with her chaplain Genius. Finally the tower falls, and Welcome, set free, allows Loving to pick the rose.

The main interest of the second part lies, of course, in the expression of the author's individuality. This reveals an amount of learning and perspicacity unusual for that time. Jean denies the divine right of kings and proclaims the sovereignty of the people. He condemns the celibacy of the clergy as immoral because unnatural; he expresses his disbelief in ghosts and sorcerers and in the influence of comets over human lives.

The immediate influence of the *Roman de la Rose* surpassed that of any other mediæval work. It is extant in more than 200 manuscripts, and a later remodeling by Marot was almost more popular than the original. It gave the impulse to the rise of allegory in other countries. Translations into foreign tongues appeared towards the end of the thirteenth century. Henry von Ahern put it into Flemish, Durante—a contemporary of Dante—into Italian sonnets, and Chaucer into English verse. Unhappily for English literature, Chaucer's translation is lost.

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ROMAN DE LA VIOLETTE, de lä vē'ō'lĕt' (Fr., Romance of the Violet). A French poem of the thirteenth century, in about 6700 rhymed eight-syllabled verses, by Gerbert de Montreuil. It tells of a woman whose virtue is the subject of a wager. She is slandered, but succeeds at last in proving her innocence. This Greek tale is the basis of the *Roman du Comte de Poitiers*, of *Floire et Jeanne*, the miracle of *Ot et Bérangier*, of the ninth story of the second day in the *Decameron*, and of Shakespeare's *Cymbeline*. Weber's opera *Euryanthe* (1823) has the same story for its dramatic theme. The *Roman de la Violette* was published by F. Michel (Paris, 1834). Consult D. L. Buffum, *Le Roman de la Violette: A Study of the Manuscripts and the Original Dialect* (Baltimore, 1904).

ROMAN EDUCATION. See EDUCATION, *Historical Sketch of the Theory of Education.*

ROMAN EMPIRE, HOLY. See HOLY ROMAN EMPIRE.

ROMANES, rō-mā'nĕs, GEORGE JOHN (1848–94). An English biologist and psychologist, born at Kingston, Canada, and educated in England (Gonville and Caius, Cambridge), France, Germany, and Italy. In 1876 and 1881 he was Croonian lecturer to the Royal Society, of which he became a fellow in 1879. In 1888–91 he was Fullerian professor of physiology in the Royal Institution of London and in 1886–90 Rosebery lecturer on the philosophy of natural history at Edinburgh. He also served the Linnean Society as its zoölogical secretary. In 1892 he founded the Romanes lecture, to be given annually at Oxford on a scientific or literary subject. Besides publishing a series of monographs on the Medusæ, Echinodermata, etc., he devoted himself to applying the principle of evolution in psychology, having early been encouraged by Charles Darwin, whose intimate friend he became. His chief works are: *A Candid Examination of Theism* (1878; 3d ed., 1901); *Animal Intelligence*, in "International Scientific Series," vol. xliv (1881); *Charles Darwin: His Life and Character* (1882); *The Scientific Evidence of Organic Evolution* (1882); *Mental Evolution in Animals, with a Posthumous Essay on Instinct by Charles Darwin* (1883); *Jelly-Fish, Star-Fish, and Sea Urchins* (1885); *Mental Evolution in Man: Origin of Human Faculty* (1888); *Darwin and After Darwin* (3 vols., 1892–97); *An Examination of Weismannism* (1893); *Thoughts on Religion* (1895; 5th ed., 1904); *Poems* (1896); *Mind and Motion and Monism* (1896); *Essays* (ed. by C. L. Morgan, 1895). Romanes' wife wrote a life of her husband and edited his letters. Consult also the critical analysis of *Thoughts on Religion* in Paul Carus, *Dawn of a New Religious Era* (Chicago, 1899).

RO'MANESQUE' ART (Fr. *romanesque*, from Sp. *romanesco*, from ML. *Romaniscus*, Roman, from Lat. *Romanus*, Roman, from *Roma*, Rome). A general name for the art that flourished in Europe during the period of fermentation before the definite constitution of nationalities, from about 800 to 1200 A.D. It is remarkable chiefly for its architecture, which overshadows all other branches. Sculpture and

painting, the origin of which for this western world falls in this epoch, are of a purely decorative character. Other decorative arts, goldsmith work, illumination, and ivory carving, were practiced with great success. Except in Italy the art of this period is chiefly monastic. The great free cities in Italy and the Imperial and feudal houses of Germany were the only great stimuli to art production besides the monasteries themselves. The first two centuries of this age were dormant and preparatory, the last two alone were productive.

ARCHITECTURE

The architecture of this period is called by the names of various schools, which are merely topographical variations of the general style, e.g., the Lombard (q.v.) in northern Italy, the Rhenish in Germany, the Saxon and Norman (q.v.) in England, the Provençal and Norman in France. The works of each may be divided into two groups according as its buildings were unvaulted or vaulted. The unvaulted type was the earlier, and in some sections continued until the end; the vaulted type was an innovation after 1000 A.D., and gradually spread over many of the most progressive regions and prepared the way for the ideal vaulted style, the Gothic. Up to 1000 A.D. the style in some regions was practically a continuation of early Christian art, as in the basilican churches of Rome; but certain new elements were introduced in the north, among which the chief were the development of the cruciform plan with elongated choir; double choirs, often raised; double transept; substitution of piers for columns or alternation of the two; crypts; and bell towers as part of the plan.

These innovations affected the scheme and composition rather than the style of construction or ornamentation. Byzantine influence is seen in a number of circular or polygonal domed churches, among which the cathedral of Charlemagne at Aix-la-Chapelle is the masterpiece. The systematic and elaborate planning of the buildings of a great monastic establishment belongs to this period, as is shown at Saint-Gall (q.v.). The church at Michelstadt is an example of the oblong plan. St. Michael at Hildesheim (1003–13) brings us to the threshold of the next stage, when vaulting began to be substituted for wooden ceilings. Thus far there had been no development of sculptural ornament or moldings; the style was perfectly plain. In Italy, from which the earlier builders in the north of Europe had originally come, the changes were hardly felt at all, and examples of timber-roofed churches scattered from one end of Italy to the other show the continued prevalence until long after 1000 A.D. of the plain basilical plan without transept, but with occasional use of the crypt (q.v.), a feature developed in the monastic churches of the north.

The renovated civilization of the eleventh century created an architecture worthy of standing by the side of the new scholastic theology, of the revived faith that led to the Crusades, and of the developing organisms of church and state. The free republics of Italy led in this field; their rivals were the Rhenish and Saxon cities of the new German Empire and the Romance cities of Provence and the rest of southern France. The eleventh and twelfth centuries were marked by extraordinary creative activity in the development of new types of monastic buildings (see MONASTIC ART) and churches and in the creation of entirely new classes of buildings, such as feudal castles (q.v.) and city houses. The monastic artists were soon rivaled by the lay guilds. The impression made by a study of Romanesque monuments throughout Europe is of unequaled variety, inventiveness, and boldness in seeking unconventional solution of architectural problems. In the absence of organized national life each province developed its special style. Certain general characteristics are, however, evident. The introduction of vaulting led to the general use of heavy walls and piers in place of the light columns and walls that had sufficed for wooden roofs. Doors and windows were splayed and decorated with moldings, carving, and sculptures, which became increasingly rich and varied. The nave was necessarily narrower and was raised higher in order to give room for windows under the vault. Heavy piers were membered with engaged shafts corresponding to the vaulting ribs and pier arches.

Thus, beginning about 1000 A.D. with plain square piers and plain openings, with very heavy walls (as at Vignory in France with its wooden roof), we proceed through progressive stages until in the twelfth century we get to the richness of Saint Sernin at Toulouse and the abbeys of Vézelay, Peterborough, Ely, and Durham. Only in a few provinces, as in Rome and Tuscany, did the old columnar basilica maintain its sway. Æsthetically the Romanesque style impresses by its seriousness of purpose, its massiveness, and its originality. The Romanesque attempts at the solution of the new problems resulting from the use of vaulting were endlessly varied: domes, round and pointed tunnel vaults, unribbed and ribbed groin vaults of every conceivable form were used. The architects were seeking for a perfect equilibrium of parts. This was not discovered until the Gothic ribbed vault and flying buttress were evolved sometime in the latter part of the twelfth century.

Italy. In Italy the diversity of styles during the Romanesque period is extreme. Venice, e.g., is predominantly Byzantine, not only in St. Mark's with its domes and mosaics and in the churches of Torcello (cathedral and Santa Fosca) and Murano, but in its private palaces with their stilted arcades, marble façades, and sculptured ornament. Then, again, the cosmopolitan culture of the Norman kings of Sicily produced a gorgeous architecture made up of Latin, Greek, and Arabic elements, as in the cathedrals of Cefalù and Monreale and the Cappella Palatina at Palermo. In Calabria there appears a pure Byzantine style, with tiny domical churches, like those of Greece; in Campania, especially at Ravello and Salerno, Moorish and Byzantine influences sometimes predominate, though we often find a strong Lombard element. Working northward, we now find two main divisions, based on different principles, the classic and the Lombard. The classic school is represented by the Roman provinces and Tuscany, which produced works of great beauty of form and color, but covered with the wooden roof. This school is best represented by the mediæval basilicas of Rome itself and by the cathedrals of Terracina and Cività Castellana. Its simple but majestic columnar interiors with rich mosaic ornament, its symmetrical brick campanili and exquisite architraved porches, re-

call the best early Christian art. Less classic, but even more monumental and gayer in their exteriors, were the Tuscan churches. Here Pisa, Venice's great rival at this time, takes the lead with its cathedral, baptistery, leaning tower, and a host of other buildings, followed by Lucca, with San Frediano, San Giovanni, and San Michele as well as Pistoia, Prato, and other smaller towns. The use of columns and wooden roof is combined with an alternation of black and white marbles borrowed from the East and with interior and exterior open arcades and galleries borrowed from Lombardy, as was also the use of relief sculpture on the façades.

The Italian churches usually had a single detached bell tower or campanile, usually to the right of the church, differing thus both from the Orient and from northern Europe, where the bell tower or a pair of them was ordinarily an integral part of the church. The Lombard style, the second of the two great schools named above, made frequent use of the groined vault, and secured a sombre impressiveness by the heavy proportions and details that went with vaulting. Externally the same impression results from the use of plain walls of brick or stone unrelieved by marble. Sant' Ambrogio at Milan and San Michele at Pavia were the earliest examples and furnished the type; the cathedrals and baptisteries of Parma, Cremona, Piacenza, Ferrara, and Modena are all superb structures, unsurpassed by buildings of any age in Italy. In this province the baptisteries are especially numerous and important (e.g., Parma and Cremona). Here also were built the earliest town halls of the free communes. Hardly less monumental, but with less consistent use of vaulting, are the south Lombard churches of Apulia, where the decoration is richer and more artistic than in Lombardy itself, as at Bitonto, Altamura, and Troia. The portals and wheel windows are the richest and most symmetrical in Italy. Apulia is also rich in churches showing French, Norman, and Byzantine influences.

France. It was in France that the Romanesque style, forsaking early Christian and classic traditions, and unaffected by contemporary Oriental art, first developed as an independent style merging into the Gothic. With greater homogeneity than in Italy, it nevertheless displays well-marked local variations or schools, e.g., those of Provence, Auvergne, and Périgord in the south, of Burgundy in the centre, and of the Royal Domain and Normandy in the north. It was in these schools that the successful struggle to create a vaulted style as a substitute for a wooden-roofed style was carried on, leading ultimately to the Gothic ribbed vault and buttress. The Byzantine domical solution with a single nave was adopted in Aquitaine, especially in Périgord, where Saint-Front at Périgueux, with its five domes over a Greek cross, is comparable to St. Mark's at Venice, and the cathedral of Cahors shows how a single long nave may be covered with a row of domes. This style, at first very plain, became enriched with typical Romanesque detail and ornament through the twelfth century, and is then represented by such masterpieces as the cathedrals of Angoulême and Fontévrault. The other most fruitful early school was that of Auvergne, in which occur the earliest examples of the long choir with side aisles, ambulatory and radiating chapels, later elaborated in the Gothic style. Its masterpiece is the largest remaining Romanesque church in France—Saint-Sernin at Toulouse, with its imposing central tower, tunnel-vaulted nave, symmetrical composition, and rich details. Tunnel vaulting and classic traditions are conspicuous in the southernmost or Provençal school. Saint-Trophime at Arles and Saint-Giles are celebrated for their richly sculptured portals. Ordinarily the churches were of moderate size, often with but a single nave, as at Avignon, Cavaillon, and Montmajour. Still commoner, however, was the three-aisled type with the side aisle so disposed as to receive the thrust of the central tunnel vault. The difficulty of providing a clerestory with this arrangement led to varied expedients to avoid the resulting dark interiors, and stimulated ingenuity in vault building, by which ultimately clerestory windows were introduced.

It was in Burgundy, however, that the tunnel-vaulted, three-aisled basilica was most highly developed by the monastic orders of Cluny and Citeaux, and the spread of these orders popularized throughout Europe the building methods current in Burgundy. The primitive form of this style is given in the great church of Saint-Philibert at Tournus, remarkable for its unique series of transverse tunnel vaults over the nave. Of equal importance was Saint-Benoît-sur-Loire, another monastic church of impressive simplicity and size, and finally the most colossal church of mediæval Christianity, the abbey at Cluny (long since demolished), on which all the wealth of perfected Romanesque style was lavished and whose influence extended over the whole province. The abbey church of Vézelay is the most perfect remaining example of this influence. Omitting some secondary schools of middle France, there remain three principal northern schools, Champagne, Ile de France, and Normandy. These differed from the more southern schools in their long retention of the wooden roof to cover even their largest structures. The two great churches at Caen, the Abbaye aux Hommes and Abbaye aux Dames, which were the precursors of the early Gothic cathedrals, were at first wooden-roofed (c.1050), their groined vaults being of later date. The Norman scheme of façade, with its two high flanking towers, and the Norman system of groined vaulting, were adopted in the Ile de France (as at Saint-Denis) and there passed into the early Gothic architecture.

Germany. The great cathedrals of Worms, Mainz, Speyer, and Bonn show how the bishops surpassed the monasteries at a time when in France the monasteries were supreme and the cathedrals insignificant. At the same time the wealth of monastic buildings was increased in the twelfth century by the advent of the Cistercian monks, who were great builders. The three earliest schools were the Rhenish, the Saxon, and the Bavarian-Swabian; while there were secondary offshoots in Westphalia, Hesse, the Main region, and in Alsace. While buildings were planned on a large scale, there was no attempt at solving the vaulting problem. Not a church was vaulted during the eleventh century, and during the twelfth few outside of the Rhenish school. The great Rhenish cathedrals as they now stand were mostly planned for wooden roofs and vaulted at a later date. First Speyer (c.1100), then Mainz (c.1125), were covered with square groin vaults, the only kind that became popular in Germany, and these were fol-

lowed by the great abbey of Laach, with its oblong groin vaults. There is, therefore, less difference between the early Christian basilicas and the Romanesque churches in Germany than in France. Some of the earliest examples are at Gernrode, Quedlinburg, Reichenau, Regensburg (St. Emmeram), Hildesheim (St. Michael). Cologne had the largest number of important churches—such as St. Pantaleon, Santa Maria in Capitolio, the Apostles, Great St. Martin—and most of them are vaulted. Their immense central domes, with large semidomes opening out as apses on three sides, give their interiors greater unity and grandeur than any other type in Germany. German churches have many peculiarities not seen elsewhere; e.g., double choirs and transepts, one at each end, are quite common (cathedrals of Worms and Mainz, abbey of Laach, etc.). So also is the alternation of columns and piers between nave and aisle, e.g., Gernrode and St. Godehard, Hildesheim. Round or octagonal towers are grouped around choirs and transepts in a way that adds greatly to the richness and symmetry of the exterior, besides the larger towers at the façade and over the intersection. No other country has so symmetrical a composition of exteriors. This is carried to great perfection in the cathedral of Bonn. On the other hand, the interiors are bare and heavy, and there is no wealth of decorative and figured sculpture such as we find in France. Columnar basilicas were built, as at Limburg, Hersfeld, Hirsau, and many other places. But the pier basilica was the commoner type. The great similarity to the Lombard churches in the exterior decoration of lines of false arcades and small open galleries proves that there was a close contact between these schools and the Rhenish, though the German is superior in beauty and picturesqueness. Besides the churches and monasteries there is a group of civil structures, the like of which was unknown in the rest of Europe, viz., the Imperial and royal palaces. Starting with the type developed by Charlemagne at Aix-la-Chapelle, there follow the palace of Henry III at Goslar, that of Henry the Lion at Brunswick, and that of Louis III of Thuringia at the Wartburg, best known of all these forms.

England. The extant architecture of Christian England antedating the Norman Conquest is very scanty. It is called Saxon, because developed under the Saxon rulers between the seventh and eleventh centuries. The great majority of its buildings were of wood; even those of stone (tenth to eleventh century) were small and were rebuilt by the Normans shortly after the Conquest. The workmanship was primitive, as in the tower at Earl's Barton, Deerhurst, Sompting, etc. The Norman style was introduced from Normandy even before the Conquest, under Edward the Confessor; but the earlier Norman work, before 1125, was generally poor, with wide-jointed masonry and details executed with the axe (chapel of the London Tower, crypts and transepts of Winchester Cathedral). Parts of Gloucester, Durham, Canterbury, and Norwich cathedrals show a better workmanship. About 1120 was begun a series of superb Norman structures, and by 1200 the main portions of Ely, Durham, Peterborough, Norwich, Rochester, Gloucester, St. Albans, Carlisle, and other cathedrals were built, as well as a great number of monasteries—especially Cistercian—such as Rievaulx, Fountains, Kirkstall, Waltham, Romsey, and Malmesbury. The characteristics of this style are heavy walls and piers, rich details, length and narrowness of plan, inability to vault wide spaces, lack of figured sculpture, constant use of geometric and schematic ornament, and use of both round and grouped piers. The portals are especially rich and deeply recessed, and their most characteristic ornaments are in the zigzag and beak molding. The naves were all covered with wooden roofs, but the aisles were usually groin-vaulted, and many of the nave roofs were later replaced by vaults (Durham, Norwich, Tewkesbury, etc.). Special prominence was given to the triforia, which form lofty galleries over the aisles. Few of the original façades remain for comparison with contemporary continental examples.

Spain. The Spanish Romanesque style commenced early in the ninth century under King Alfonso II of Asturias, with the renewed life of Christian Spain. The new capital, Oviedo (San Tirso, San Julian), and the neighboring Naranco (Santa María, San Miguel) show a mixture of early Christian and Byzantine influences (c.800–850), as do later churches at Valdedios, Priesca, and Barcelona. Moorish influence also becomes prominent. With the eleventh century the south of France inspires the Spanish school in its further revival. The increased prosperity of the Christian cities of Spain, to many of which French bishops were appointed, caused a revival in cathedral architecture, which adopted the vault in all its forms, the tunnel being used ordinarily for the nave, the groined for the aisles. San Isidoro at Leon, the old cathedral of Salamanca, that of Zamora, the church of Toro, and Sant' Iago at Compostella are characteristic examples, Salamanca being the earliest and Sant' Iago the most consummate work. These Spanish churches are grandiose and equal to the foremost French buildings, even surpassing them in some features, such as the effective domes over the intersection in old Salamanca and Compostella. Examples of tunnel-vaulted hall-churches are at Gerona, Huesca, and Segovia, similar to those of Provence and Languedoc. The most important groin-vaulted churches are Santa María at Tudela and the cathedrals of Tarragona and Lérida, remarkable for unity of plan, solidity of construction, and beauty of detail. They bear great similarity to the school of Anjou. San Vicente at Avila has the most interesting figured sculptures on its façade and an exceptionally beautiful triforium gallery. The Spanish school reaches its most glorious period when the time approaches, towards 1200, for France to give her the Gothic as she had given her the Romanesque.

SCULPTURE

In the minor forms of sculpture Byzantine and early Christian models were generally followed during the Romanesque epoch (see BYZANTINE ART), the awakening of monumental sculpture having been due to the demand for architectural decoration.

France. Such was particularly the case during the Carolingian revival in France and Germany. In the south of France, however, stone sculpture on a larger scale was used in connection with church architecture. The façades were crowded with statues, often representing a larger composition, and statues even took

the place of columns in the cloisters. Technically inferior to those of the succeeding Gothic period, they were more characteristic and individual. The school of Provence was dignified and quiet in character, concealing technical deficiencies by rich decoration; that of Burgundy, more finished in technique, more fanciful and inventive, but grotesque and dramatic; that of Toulouse, more finished and studied. A curious combination of Carolingian and Byzantine influence is shown by the school which in the first half of the twelfth century created the fine façade of Angoulême, the entire sculptures of which form one composition, a "Last Judgment," and the rich portal of Cahors.

Germany. During the ninth century carving in ivory, after early Christian and Byzantine models, was extensively practiced. An important centre was the monastery of Saint-Gall, where Tutilo was the chief master. Foreign influence rather increased under the Othos, being promoted by their frequent expeditions to Rome and the marriage of Otho III with the Byzantine Princess Theophano. Though ruder than their models, the native workmen display more naturalism and individuality. Monumental sculpture did not arise until the eleventh century, through the instrumentality of Bishop Bernward of Hildesheim. Impressed by the columns of Trajan and Marcus Aurelius at Rome, he erected one of his own at Hildesheim, besides furnishing his own cathedral with bronze doors. The resulting Saxon school was especially occupied with articles of church furniture, and invented bronze sepulchral slabs. Among its most important productions are the portals of the cathedrals at Augsburg, Verona, and Gnesen, the baptismal font of Merseburg, and especially the beautiful gold altar front which Henry II presented to the cathedral at Basel. It was in such metal sculpture that Germany easily excelled other European countries during the Romanesque and even the Gothic epoch. The goldsmith work of the Rhenish school during the twelfth century was unsurpassed in technical excellence, while bronze casting reached its apogee in the font (1112) designed by Lambert Patras for St. Bartholomew at Liége. Sculpture in stone, on the other hand, was less advanced than in France and Italy.

Italy. During the twelfth century, in connection with façade decoration, a species of Romanesque sculpture originated in Lombardy and Tuscany, which during the thirteenth century was applied to interior decoration as well. Its technique was rude, the figures being short and coarse, the expression and dramatic action childish, the draperies very primitive. The best work of this school is found in Lombardy, especially in the cathedrals of Modena and Ferrara, in St. Zeno, and the cathedral at Verona. During the later twelfth century considerable progress was made by Benedetto Antelami, whose sculptures in the cathedral of Parma and the neighboring Borgo San Donino show nature study and a sense of form and motion. At Venice Byzantine influence prevailed, although the sculptures of the main portal of St. Mark and, in the interior, the angels under the cupola are Romanesque in character. Tuscan sculpture is more primitive in character; the revival under Nicola Pisano in the thirteenth century is of sufficient importance for general development to merit treatment in the article SCULPTURE.

PAINTING

Germany. Mural painting was extensively practiced under the patronage of Charles the Great, but of the decorations which we know existed in the royal palace and in the churches no examples survive. Contemporary miniatures, however, which correspond in the main with these frescoes, reveal an art still following early Christian traditions in general plan, but possessing a highly developed system of ornament Germanic in character. Under the successors of Charles painting declined, but with the development of Romanesque architecture it found increased employment, as early as the ninth century, on the large wall surfaces of most German churches. These paintings are executed with rapid technique, and are decorative in color and design, the background being generally blue, the colors light, and the halos of saints and borders of costumes laid over with gold. Though inferior to contemporary Byzantine art in technique, they contain elements which it lacks—life, character, and action. The oldest examples are in the church of Oberzell in the island of Reichenau (tenth century); of better quality are, among others, the paintings in the lower church of Schwarzrheindorf (twelfth) and in the cathedrals of Brunswick and of Gurk in Carinthia (early thirteenth). Panel painting was also practiced, especially upon the ceilings of flat-roofed basilicas, of which the best example is that of St. Michael's at Hildesheim (after 1186). Smaller panels upon gold backgrounds were also used, at first as the antependia of altars.

France and Italy. Romanesque wall paintings in France are not so common, the most important being in the central provinces—in the chapel at Liget (Indre-et-Loire), in Saint-Jean at Poitiers, and Saint-Savin at Poitou—all dating from the twelfth century. In Italy painting lagged far behind, being purely mechanical and for the most part under Byzantine influence. Roman examples of the period are excessively rude, while the frescoes at Sant' Angelo in Formis at Capua, like others in southern Italy, were probably executed by native artists under Greek influence. In the mosaics of the period Italian pictorial art found its best expression, especially in those at Venice and in Sicily. (See MOSAIC.) They, in common with all forms of painting, were dominated by the Byzantine style.

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ROMAN FESTIVALS. For a partial list of Roman festivals, see Festivals, fourth paragraph. For the festivals known as *ludi* see Games, Ancient. See also Acca Larentia (for the *Larentalia*); Ambarvalia; Apollo (for the *Ludi Apollinares*); Ceres (for the *Cerealia*); Decennial Games; Faunus (for the *Faunalia*); Flora (for the *Floralia*); Hilaria; Juno, last paragraph (for the *Matronalia*); Lemures (for the *Lemuria*); Libera (for the *Liberalia*); Lupercalia; Minerva, *Roman* (for the *Quinquatria* or *Quinquatrus*); Megalesia; Pales (for the *Palilia*); Neptune (for the *Neptunalia*); Quirinus (for the *Quirinalia*); Sacraria, Argeorum (for the *Argei*); Salii (for the *Armilustrum* and the *Quinquatrus*); Saturnalia (this article covers also the *Conseralia*, the *Opalia*, and the *Sigillaria*); Terminus (for the *Terminalia*); Vesta (for the *Vestalia*); Vulcan (for the *Vulcanalia*). Consult: W. W. Fowler, *Roman Festivals* (London, 1899); id., *The Religious Experience of the Roman People* (ib., 1911); Georg Wissowa, *Religion und Kultus der Römer* (2d ed., Munich, 1911).

ROMANINO, rō'mȧ-nē'nō, Girolamo Romani, called (1485–1566). An Italian painter of the Brescian school. He was probably a pupil of Feramola, and though influenced by Giorgione, Titian, Salvoldo, and Lotto, he remained Brescian at heart. His altarpieces are usually too fiery in tone and his best work is in fresco. Here he often represents with charming ease and dignity mythological and religious scenes which display a happy sense of design, dramatic imagination, freshness of color, and peculiar skill in the handling of light. Among the most characteristic are the frescoes in the castle of Trent, in the open-air shrine at Villongo (Bergamask), in the Duomo at Cremona, and "Christ at Emmaus," in the Martinengo Gallery, Brescia. Many of his altarpieces are in Brescia, and he is well represented in the Padua Gallery, the Johnson collection, Philadelphia, and elsewhere. He also left a few notable portraits.

ROMAN LAW. See Civil Law.

ROMANO, Ezzelino da. See Ezzelino da Romano.

ROMANO, Giulio. See Pippi, Giulio.

ROMANOV, rō-mä'nôf. The Imperial house of Russia. The founder of the family is generally considered to be Andrew Kobyla, who is mentioned in the Russian chronicles in 1347 and who was in the service of the Grand Dukes Ivan Kalita and Simeon the Proud. The father of Kobyla, Ivan Divinovitch, of Prusso-Lithuanian princely stock, went to Russia in the thirteenth century, accepted Christianity, and entered the service of the dukes of Moscow. The boyar Roman Yurievitch, the fifth in direct descent from Andrew, died in 1543, leaving a son and a daughter, the latter becoming Czarina by her marriage with Ivan the Terrible (1547). The descendants of Roman accepted the name Romanov. The son, Nikita, was one of the regency during the minority of Feodor I, and his eldest son, Feodor, under the name of Philaret, was elevated to the rank of archimandrite and Metropolitan of Rostov during the reign of the false Demetrius (1605–06). He refused to recognize the Polish Prince Ladislas as Czar of Russia in 1612, and for this the Poles took him with them on their retirement from Moscow in face of the nationalist rising and held him captive for nine years. In February, 1613, the Russian nobles and clergy chose as their ruler Michael Feodorovitch Romanov, the son of the imprisoned Metropolitan and the representative, through his grandmother, of the royal house of Rurik. He was succeeded by his eldest son, Alexis (1645–76). Alexis was twice married, and left by his first wife two sons, Feodor and Ivan, and several daughters, and by his second wife one son, Peter. His eldest son, Feodor (1672–82), died without issue, and was succeeded by his half brother, Peter the Great, with whom Ivan was associated until 1689. Peter was twice married; by his first marriage he had a son, Alexis, who died in his father's lifetime, leaving one son, Peter. Peter the Great was succeeded by his wife, Catharine I (q.v.), by whom he had two daughters, Anna and Elizabeth. Catharine I (1725–27) left the throne to the son of Alexis, Peter II (1727–30), the last of the male line of Romanov; and on his death without heirs the succession reverted to the female line, the daughter of Ivan, Peter the Great's half brother, Anna Ivanovna, being placed upon the throne (1730–40). She was succeeded by her infant grandnephew, Ivan IV (1740–41). A revolution drove Ivan's family from the throne, of which the cadet female line in the person of Elizabeth (1741–62), the daughter of Peter the Great and Catharine, now obtained possession. On her death her nephew, Peter, the son of her elder sister Anna Petrovna, who had married the Duke of Holstein-Gottorp (belonging to a cadet line of the family of Oldenburg), mounted the throne as Peter III (1762). He was dethroned and succeeded by his wife, the Princess Sophia Augusta of Anhalt-Zerbst, who reigned from 1762 to 1796 as Catharine II. She was succeeded by Paul I, her only son by Peter III. Paul (1796–1801) perished by assassination, leaving several sons, the eldest of whom was Alexander I. Alexander (1801–25) left no heir, and the crown at his death devolved by right upon his next brother, Constantine. Constantine, however, in compliance with the wish of Alexander, had previously re-

linquished his claims to the supreme power, and the third brother, Nicholas I, ascended the throne. Nicholas (1825–55) was succeeded by his son, Alexander II (1855–81). Alexander II was assassinated in 1881, and his son, Alexander III, succeeded him, to be followed in 1894 by his son, Nicholas II. Constant intermarriages with German princely houses have made the Romanov strain of to-day far more German than Russian. Consult H. S. Edwards, *The Romanoffs: Tsars of Moscow and Emperors of Russia* (London, 1890), and R. N. Bain, *The First Romanovs* (New York, 1905).

ROMAN RELIGION. The original religion of the early Romans has been so overlaid and transformed by the accretions of later times, and in particular by the assimilation of the whole structure of Greek mythology, that any summary reconstruction must give much that is probable rather than certain. Unfortunately, the most extensive alterations were already accomplished long before the Roman literary tradition began, and, though such writers as Varro, Verrius Flaccus, and Servius had many sources from which to draw, the origins were in most cases unknown to them, while Ovid in his *Fasti* is obviously strongly influenced by his Alexandrian models and has frequently transformed Greek myths to fill the gaps caused by the lack of such stories in Roman tradition. The fundamental basis for the study of the early Roman religion is found in the calendars or fasti (q.v.), of which some 30 are known, only one of which, however (the Fasti Maffeiani), is nearly perfect. All can be dated between 31 B.C. and 46 A.D. and are the result of the revision of the calendar by Julius Cæsar. These documents, however, are plainly composed of two elements, distinguished by the size of the letters, and it can scarcely be doubted that the large capitals represent the official pre-Julian calendar, as published, we are told, for the first time in 304 B.C., to make known the days when business could be legally transacted. The names and days of 45 public festivals (*feriæ publicæ*) of fixed dates were indicated. This calendar is supplemented by the literary tradition, which rests largely on the lost works of the great Roman antiquaries and in the use of which it is necessary to distinguish sharply between the statements as to actual religious observances and the deductions or explanations evolved by the writers themselves.

The Roman ritual clearly distinguishes two classes of gods, the *di indigetes* and the *di novensides* (or *novensiles*). The latter were the new introductions; all divinities whose cults were introduced in historical times were reckoned among them. The *indigetes* were the original gods of the Roman state, and their names and nature are indicated by the priests of the first class and the fixed festivals of the calendar, supplemented by other notices; for, though the calendar was not published until 304 B.C., it had long been in existence as part of the secret knowledge of the pontiffs, perhaps from the regal period. This analysis yields a list of over 30 names honored with special festivals or special priests, showing on the whole a well-defined field of activity, which is appropriate to a distinct type of community. Moreover, there is a strong tendency to incorporate in a pair of male and female divinities either the same function or two complementary fields of activity. So we have Jouis and Jouino (Juno), Faunus and Fauna, Janus and Vesta, etc. (See FAUNUS; PALES; POMONA.) In most cases the female divinities have no independent cult and gradually fade away. Vesta (q.v.), of course, is a marked exception, and Juno (q.v.) an apparent one, though here the later prominence of the goddess is due to the independent development of foreign elements. Besides, early Roman religion worshiped a host of specialist gods, as they have well been termed. Fragments of old ritual accompanying various acts, such as plowing or sowing, show that at every stage of the operation a separate deity was invoked, whose name is regularly derived from the verb for the operation. Such divinities also may well be grouped under the general term of attendant or auxiliary gods, whom we find invoked along with greater deities. At the head of this early pantheon stand five names, Janus, Jove, Mars, Quirinus, and Vesta, of whom the second, third, and fourth form an ancient triad, while their special priests are the three greater flamens, *Dialis*, *Martialis*, *Quirinalis*, and the first and fifth are said to be the proper gods to begin and end any invocation of a number of divinities; and a similar position, before and after the three flamens, is held by representative priests, the *rex sacrorum* and the *pontifex maximus*. The *indigetes* and their festivals show that we are dealing with an agricultural community, but also one fond of fighting and much engaged in war. The gods represent distinctly the practical needs of daily life, as felt by the Roman community to which they belong and which scrupulously pays them the proper rites and offerings. Thus, Janus and Vesta guard the door and the hearth, the Lar protects the field, Pales the pasture, Saturnus the sowing, Consus and Ops the harvest, Ceres the growth of the grain, and Pomona the fruit. Even Jupiter is honored chiefly for the aid his rains may give to the farms and vineyards, though he also, through the lightning, guides the acts of men, and by his widespread domain can aid Romans outside their borders. Prominent early were two war gods, Mars and Quirinus, the former specially honored in March and October, i.e., at the opening and closing of the campaign, the latter patron of the armed community in time of peace. In this early stage there seem to be no temples or images of the gods, who are worshiped in sacred groves or at altars in the open air, save the temple of Vesta; Vesta, as her nature requires, has her own house. In fact, there is no real individuality in these early gods, nor are there any marriages or genealogies. Mythology is not a Roman invention. The scanty traces of legend sometimes gather about a sacred animal, which is a sign of the presence of the deity or some token which could recall him to the worshiper, such as the flint of Jupiter or the spear and shields borne by the Salii (q.v.) in honor of Mars. This older worship is associated by Roman legend especially with Numa Pompilius, and, though the name Numa Pompilius may be an invention, the location of the sanctuaries indicates an early period in the growth of the city.

At an early date, however, new elements were added to this ancient system. The legend ascribes to the royal house of Tarquin the establishment of the great Capitoline triad, Jupiter Optimus Maximus, Juno, and Minerva, which soon assumed the supreme place in the Roman

religion. (See CAPITOL.) Other additions were the worship of Diana on the Aventine, the introduction of the Sibylline Books (see SIBYLLINE ORACLES), and the appointment of men to carry out the sacred rites which they directed. All these changes result from the introduction of foreign cults. These came partly from the Latin league in which Rome had acquired a leading position, partly from Etruria, where, however, Greek influence had also been at work, and partly from the Greek cities of southern Italy, especially Cumæ, with which legend connects the Sibylline Books. This new movement brings with it temples, built at first in the Etruscan style and apparently by Etruscan architects, though later by Greeks. The Capitoline sanctuary became the central shrine of the Roman state, and one of the privileges granted to a colony (*colonia*) was the right to found a similar capitolium in honor of the three gods. Thus, though a later introduction, these new deities quickly assumed a place beside or even above the ancient gods, and they were recognized as equal or superior members of the hierarchy. From this time, which must have preceded the establishment of the Republic, the history of the Roman religion is that of a constantly increasing number of divinities. The cults brought from foreign parts, especially Greek lands, under the direction of the oracular books and requiring the importation of a native priesthood, were carefully kept outside the pomœrium (q.v.), and, when such Greek gods as the Dioscuri had a temple in the Forum, the apparent exception is easily explained by the high position of Castor and Pollux at Tusculum, whence their worship was brought to Rome.

The absorption of the neighboring native gods is easily understood. Since the earlier gods had been regarded as peculiar to the Roman state, as that state grew and conquered the surrounding territory the new local gods became entitled to receive at the hands of the Romans those honors which had before been their due. In many cases we hear of a formal invitation to these gods to take up their abode in the new sanctuaries at Rome. Moreover, the growth of the city attracted foreigners, who were allowed to continue the worship of their own gods. Besides Castor and Pollux the Italian communities seem to have contributed to the Roman pantheon Diana, Minerva, Hercules, Venus, and others of lesser rank, some of whom of course were originally derived from Greece, though others may well have been Hellenized from Italian divinities. From the Greeks came at an early date Apollo, and in 496 B.C. the Sibylline Books ordered atonement to Demeter, Dionysus, and Kore, whose temple was dedicated under the Latin name of Ceres, Liber, and Libera, through an identification of the Greek divinities with the old Roman gods. About the same time Hermes, under the name Mercurius, was recognized as the god of merchants and trade. Both these cults are connected by legends with a famine, which may well have led to their introduction along with the grain of the south. Poseidon appears among the Roman gods under the name of an old Italian divinity, Neptunus, as early as 399 B.C. These cults were all introduced at a relatively early date in the history of the Republic; and then for a time the expansion seems to have taken place rather by the assimilation of Italian divinities, often as new phases of the old cults, or by the creation of new gods, especially from abstract qualities such as Fides (Fidelity) or Bellona (as goddess of war). In 293 B.C., however, during a plague, the Sibylline Books advised summoning the god Æsculapius from Epidaurus. In 249 B.C. followed the introduction of the cult of Hades and Persephone under the Latinized names of Dis Pater and Proserpina, and in their honor the first celebration of the ceremonies from which developed the secular games (q.v.). In 205 B.C. came the first of the Eastern gods, Cybele, the *magna mater*, whose sacred stone, probably meteoric, was brought with great pomp and amid many miracles from Pergamum, through the favor of Attalus, who seems to have secured it from the holy temple of Pessinus.

At the same time the process of Hellenization was advancing in other ways, and the pressure of the Second Punic War seems to have aided its progress, from the need then felt of appeasing the angry gods by more powerful atonements. Now we find a cycle of 12 gods (*di consentes*) obviously derived from the Greeks, though the divinities are partly Roman, officially recognized by statues in the Forum, and from this time we hear little of the introduction of new Greek divinities; the change takes place rather in the identification of Greek gods with Roman and the transference to the Roman deities of a large mass of Greek myths, whereby the original nature of the Roman gods was more and more obscured. Moreover, the newly developing Roman literature, thoroughly saturated with Greek thought even where it was not direct translation, powerfully aided in popularizing Hellenic conceptions.

With the coming of Cybele the orgiastic element was added to the attractiveness of the Greek ceremonial and, in spite of some efforts at restriction, speedily exercised a destructive influence, which reached its height a few years later when the orgies of the Bacchanalia (see BACCHUS) called for the severest measures from the Senate. The tendency, however, was not to be checked, and the long wars in Asia Minor, the seat of strange cults, together with the growing disbelief in the old gods and the search for new superstitions by many belonging to the upper classes, furnished abundant material for its growth. Asiatic, Egyptian, and even Semitic cults of farther east poured into Rome under the Empire until they had almost supplanted the old religion in the popular mind. See ISIS; MITHRAS; OSIRIS; SERAPIS.

The transference of Greek myths to the state religion, and perhaps even more the prevalence of Greek philosophy among the educated, brought about an increasing neglect of the old rites, and in the first century B.C. the old priestly offices declined rapidly, for the men whose birth called them to these duties had no belief in the rites, except perhaps as a political necessity, so that pontiffs, augurs, and such bodies became mere tools in the party strife. A thorough reform and restoration of the old system was carried out by Augustus, who became himself a member of all the great priestly colleges, revived some that had become extinct, such as the Arval Brothers, and rebuilt ruined temples. With this revival was joined the prominence given to Apollo as a patron god of the Emperor, through the erection of the splendid temple on the palatine, the intrusting

to its guardianship of the state collection of oracles, including the Sibylline Books, and the joining of Apollo and Diana with the Capitoline gods in the secular games. In spite of these reforms the religion tended more and more to centre in the Imperial house, and this was stimulated by the deification of certain emperors after their death. (See APOTHEOSIS.) The first so honored was Julius Cæsar; then follow Augustus, Claudius, Vespasian, and Titus, while after Nerva few emperors failed to receive this distinction. This cult was more prominent at first in the provinces than in Rome, and it was outside Rome that the actual worship of a goddess Roma seems to have arisen. The personified Roma had appeared on coins and elsewhere, and had been the object of foreign dedications under the Republic, but her reception among the state divinities was due to the erection of the great temple of Venus and Rome by Hadrian in 128 A.D.

The forms of the Roman religion were naturally as varied as the origins of the numerous cults which it included. The early worship was markedly simple. The first fruits of field or garden, or flocks, flowers, and wreaths, the coarse-pounded grain, and cakes were the usual gifts; sometimes a meal was set before the god. Such offerings might be made by family or community at their own altars, and when made by the state differed only in the size of the offering, so that public animal sacrifices, especially of the larger animals, were more frequent. But if the offering was simple the ritual was complex. The vessels and implements were prescribed and bespeak the primitive civilization of the early worship. Sometimes the sacrificial knife was of flint, the vessels of clay, molded without the aid of the potter's wheel, and the victims must correspond exactly to the minute requirements of the law. The prayers and gestures of the priest were prescribed in detail and must be repeated with the most scrupulous accuracy, so that it is easy to see the importance of the college of pontiffs, in whose charge were the books of ritual and without whose assistance few magistrates could have performed their religious duties. The *Græcus ritus* naturally was conducted according to the usages of the country from which the god had been brought, but the Hellenization brought the increase of *ludi*, or games and spectacles, as part of the worship, and especially the institution of the *supplicatio* and *lectisternium*, wherein the gods were placed on couches beside prepared tables and feasted for one or more days, while at the same time the people were summoned to visit the temples and pray, either in supplication if the celebration sought some gain, or in thanksgiving if a victory was the occasion. The *lectisternium* or banqueting of the god also took place in his temple on the day of its special festival, but in its extended form, when several gods were brought together into one place for the banquet, regularly formed part of a solemn act of purification and entreaty or of special thanksgiving.

For further details of the Roman religious system, see the articles on the individual gods and also ARVAL BROTHERS; AUGURIES AND AUSPICES; FLAMENS; GAMES, ANCIENT (for the *ludi*); LUPERCALIA; LECTISTERNIUM; PONTIFEX; ROMAN FESTIVALS; SALII; SUOVETAURILIA; VESTA.

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ROMANS, rō'mănz'. A town in the Department of Drôme, France, on the right bank of the Isère, 11 miles northeast of Valence (Map: France, S., K 3). A bridge built in the ninth century connects Romans with the small town of Péage on the left bank of the river. Romans owes its origin to an important abbey, founded in the ninth century by St. Bernard, Archbishop of Vienne, and by a nobleman named Romain, who gave his name to the town. Silk and woolen fabrics, leather, shoes, hats, and oils are largely manufactured, and a very active general trade is carried on. Pop., 1901, 17,140; 1911, 17,201.

RO'MANS, EPISTLE TO THE. One of the New Testament letters of the Apostle Paul, addressed to the church at Rome, and the one generally recognized as his most important production. It was written probably early in the year 55 or 56, at the close of the Apostle's third missionary journey, during his last visit to Corinth, after he had practically finished his work in the East. Briefly stated, its contents are as follows: after an introductory section (i. 1–17) containing the usual epistolary introduction (i. 1–7), a thanksgiving (i. 8), an explanatory statement (i. 9–15), and closing with the announcement of the theme of the Epistle (i. 16–17), the main argument begins at i. 18 and extends to xv. 13. This consists of three main divisions. I. An exposition of the Christian life or experience as an experience of the righteousness of God through faith in Christ (i. 18–viii. 39). The Apostle develops this by arguing (1) that the whole world is sinful and under condemnation (i. 18–iii. 20); (2) that the righteousness of God is a righteousness of faith (iii. 21–iv. 25); (3) then by setting forth the consequences and implications of justification by faith (v. 1–vii. 25); (4) concluding by an exposition of the Christian life as the life of the Spirit (viii. 1–39). II. The place of Israel in the divine plan of salvation (ix–xi).

III. The practice of the Christian faith (xii. 1–xv. 13). The rest of the Epistle (xv. 14–xvi. 27) is devoted largely to personal matters.

The Pauline origin of Romans has received practically universal recognition, occasional critical objections having met with such scant acceptance by the critical world that they may be considered as of no real value.

The main critical questions regarding Romans are (1) that of its integrity, especially the relation of the last chapter to the rest of the letter, (2) whether the membership of the church at Rome was predominantly Jewish Christian or Gentile Christian, and (3) the situation in the Church which the letter was intended to meet. As to the first question, doubtless there are striking peculiarities in the closing portion of the Epistle as it now stands. 1. It is noticeable that a benediction occurs twice—once at verse 20 in chap. xvi and, previously, at the last verse of chap. xv. Along with this repetition there seem to be other endings to the Epistle besides that at its close, viz., at xvi. 20, at xv. 33, and also at xvi. 16. 2. It seems singular that in a church which Paul had neither founded nor visited, as in this case, there should be so many personal acquaintances and fellow companions with him in his work (cf. especially verses 3, 4, 7, 9, 11, 13). To account for this several theories have been advanced, the most widely accepted being that of Schulz (1829), viz., that this last chapter belongs to a letter (now lost) addressed by Paul to Ephesus, where he had been at work for some years just before he wrote Romans. It is true that with the circumstances of Paul's Ephesian work several of the names seem strikingly in accord (e.g., Priscilla and Aquila [cf. 1 Cor. xvi. 19, 2 Tim. iv. 19] and Epænetus, spoken of as "the first fruits of Achaia unto Christ"). And the fact that this last chapter was written from Corinth or its neighborhood (xvi. 1), and that between the churches of this city and Ephesus communication was frequent and easy might account for its concluding portion being ultimately attached to Romans, since, if copies of both letters were retained in Corinth, the distinction between them or surviving portions of them might finally disappear and they be thought to be parts of one letter. Finally, the omission of this last chapter, and even the one preceding it, in one or two important manuscripts would seem to point to there being at least two letters combined in our present Epistle. On the other hand, when it is remembered that the Epistle was early altered for dogmatic and liturgical purposes, and that the position of the doxology at the end of chap. xiv in many manuscripts is in accord with Paul's habit of introducing such passages into the body of his letters rather than at the end; further, when it is recognized that it was Paul's custom to append personal salutations to the letters he wrote to churches he had not founded and in which he had not worked (cf. the concluding chapter of Colossians with those of Thessalonians, Corinthians, Galatians, and Philippians); and when it is realized that the church at Rome was not only largely Gentile in its membership (i. 5–7, 13–15; xi. 13, 14; xv. 14–16), but that the drift from all parts of the Empire to Rome must have carried many converts from Paul's eastern mission fields, especially from the cities of Antioch, Ephesus, and Corinth; and when it is understood that from funereal inscriptions in Rome and inscriptions containing names of freedmen and members of the Imperial household, practically all the names in chap. xvi can be shown to be possible Roman names, while from Ephesian inscriptions and those of the western Asia region in which the Apostle's work was done only a small proportion of them are so traceable—when these facts are considered much is disclosed in favor of the view of many modern scholars that the chapter is an integral part of the Epistle to Rome. With either theory, however, the difficulty in the repetition of the benediction and the apparently final passages would be referred to the Apostle's occasional habit of interrupted closing thought, as manifested in admittedly Pauline Epistles like Philippians (cf. iv. 7, 9, 20, 23; see also 2 Thess. ii. 16, iii. 5, 16, 18), although the Ephesian theory has manifestly less of this repetition to account for.

As to the second question, while there is essential agreement as to the mixed character of the church's membership, on the one side passages such as vii. 1–6, viii. 15, ix. 1–5, x. 1–3 are appealed to as showing a recognition by the Apostle of the Jewish Christian character of the church to which he was writing, while on the other side passages such as i. 13–17, xi. 13–32, xv. 14–17 are cited as showing the consciousness that he was writing to a church predominantly Gentile Christian in character. The latter is undoubtedly the correct view.

As to the third question, it must be remembered that the letter was due primarily to the desire on the Apostle's part to prepare the way for his visit to this stranger church; but, while this desire may account for the sending of a letter in advance of his departure for the West, the specific character of that letter would depend naturally on the condition of the Church to which it was sent. The many views as to what the situation at Rome was, may be roughly reduced to three types: (1) That which holds that, because of the important position held by the church at the capital of the Empire, it invited a systematic presentation of Christian truth from the Apostle. This is the oldest view and the one generally prevailing. It has in its favor the peculiarly systematic character of the Epistle, unique among Paul's writings; against it is urged the fact that the system presented is manifestly incomplete. Within the range of Christian truth there are practically but two topics presented—the doctrine of man's sinfulness and the doctrine of salvation. But this criticism overemphasizes the necessity of doctrinal completeness on Paul's part. Systematic theology was not yet born in Paul's day. His wide experience as an apostle had led him to see what were the most vital elements of the gospel. To an effective presentation of these he gave himself in this Epistle. (2) That which holds that through either the actual presence or threatened coming of Judaizing teachers the church needed to combat their peculiar errors. There is probably some truth in this, although neither the polemical nor the partisan passages (chaps. ii–iv, vi, ix–xi) imply a distinctively Judaistic situation. The Epistle is not a controversial writing like Galatians and 2 Corinthians. But Jewish and Judaistic opposition to Paul's gospel was likely to show itself in almost any centre of Christian activity, and at Rome such opposition to Christianity would be

likely to occur at any time. (3) That which holds that the partisan condition of the church was of a character that called for an irenic treatment on the Apostle's part. This was suggested as early as Augustine, reappearing subsequently at times. It has come into favor lately largely through the growing conviction of the untenableness of the other views. There is much in its favor, especially the characteristic combination of Jew and Gentile in the earlier part of the Epistle, and yet the question arises: if this view be correct how understand the Gentile rebuke contained in chaps. ix–xi? On the whole the contents of the Epistle favor the first view as most fully accounting for its special character.

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ROMANS, King of the. A name for the elective head of the Holy Roman Empire (q.v.) before his coronation as Emperor by the Pope; he was also known as the German King. Napoleon I, who aspired to the traditions of the older Empire, named his son King of Rome.

ROMANSH, rō-mānsh′ *or* rō-mānsh′. See Romance Languages.

ROMAN'TICISM (from *romantic*, Fr. *romantique*, from OF., Fr. *roman*, novel, romance). A term employed to designate the modern rise and development of imagination and sensibility in the literatures of western Europe and to indicate the tendency of nineteenth-century authors to rid literature of Greek and Roman rule. Romanticism is sometimes opposed to the restraint of classicism and again to the literalness of realism. On the one hand, classicism, which had been so warmly espoused by the humanists, had degenerated into a feeble effort to express the modern world in a high-flown but lifeless jargon in which mythological references abounded. This was especially true of the drama. On the other hand, a certain school of Realists, who came after the tide of romanticism had begun to ebb, hampered their imaginations for the sake of what they believed to be scientific transcriptions of life. Against it the later Romanticists rebelled. It may be said that Realists and Romanticists (or romancers) have worked peacefully side by side since 1850, and the schools have common readers.

In the Augustan period English literature, barren of strong passion except the indignation of satire, made its primary appeal to the intellect; its ideal was good sense. Pope reasoned in verse, writing essays in criticism and in morals; Swift employed the fantastic romance to satirize his contemporaries and mankind as a species; Addison ridiculed with urbanity the foibles of society; and rarely did any writer look beyond London. It was the province of romanticism to rediscover that man is more than intellect; that he possesses imagination and emotions. Between 1726 and 1730 James Thomson, a Scottish poet, published his *Seasons*, poems which definitely mark a new interest in external nature. He was soon followed by many imitators, known as the landscape poets; then came Gray's "Elegy in a Country Churchyard," Goldsmith's "Deserted Village," and Cowper's "Task." This descriptive poetry reached its highest development in Scott, Byron, Keats, Wordsworth, and Shelley, who lent to nature "the light that never was, on sea or land." By the middle of the eighteenth century the lyrical cry, long suppressed in English literature, broke forth again. At first it was a refined melancholy, as in Collins and Gray; afterward it broadened into a noble humanity in Cowper, Burns, and Wordsworth. Finally passion and description were fused in the lyrics of Shelley, where, says Woodberry, "nature is emptied of her contents to become the pure inhabitancy of the human soul." Again, the age of Pope and Addison had lost the mood of superstition and wonder. That mood soon returned, and as the date for it we may take Collins's "Ode on the Popular Superstitions of the Highlands of Scotland" (written in 1749). In 1764 Horace Walpole published the *Castle of Otranto*, which initiated the romance of the ghost and the nightmare. This kind of literature was spiritualized by Coleridge in the "Rime of the Ancient Mariner" (1798). Moreover, the first half of the eighteenth century cared little for the past. On history Fielding was very satirical, declaring that there was more truth in *Tom Jones* than in Lord Clarendon. But with the ghost came history, which was incorporated into romance. Most of these characteristics of romanticism—the love of the picturesque, history, and superstition—found combined expression in Scott, first in his verse tales and afterward in the Waverley novels. Scott, however, was rarely lyrical, and the supernatural awakened in him little of the mystic's awe. For mysticism, which was becoming one of the notes of romanticism, we look rather to the Neoplatonism of Wordsworth, the pantheism of Shelley, and, for its full development, to the Pre-Raphaelite Brotherhood (see Pre-Raphaelites), of which Rossetti was the central figure.

For their matter the Romanticists turned to our earlier literature—to Milton, Spenser, Shakespeare, to ballads, metrical romances, Celtic and Norse stories, Greek art and literature, and later to Dante. In this search for what was new they were aided by scholars. In 1755 P. H. Mallet, a native of Geneva and professor of belles-lettres at the University in Copenhagen, published the first part of his *Histoire de Danemarck*, of which an English translation by Thomas Percy appeared in 1770. This book first made generally known to England the gist of the Eddas. Five years before Percy had published a collection of English and Scottish ballads under the title of *Reliques of Ancient*

English Poetry. This ballad book has been called the Bible of the romantic reformation. Another publication of influence was Macpherson's *Ossian* (1760–63), prose poems with occasional Celtic motives. The Romanticists also had their advocates in criticism. In 1754 appeared Thomas Warton's *Observations on the Faery Queen of Spenser*, a defense of romantic themes. Two years later Joseph Warton published an *Essay on Pope*—a second essay on the same subject he published in 1782—an important contribution to romantic criticism. Pope, who had been regarded as the most correct of English poets, Warton placed below Milton and Spenser, and added that he was often surpassed by Thomson and Gray. As marking the progress of romantic criticism we should also mention *Letters on Chivalry and Romance* (1762), by Richard Hurd, in which Spenser was placed highest among English poets. The case of romanticism against classicism was argued by many others. For example, W. L. Bowles issued in 1806 a new edition of Pope, prefaced by severe strictures, which led to a lively controversy, in which Byron took part on the side of Pope. By this time our old writers and the new Romantic school were being interpreted sympathetically by Lamb and Hazlitt.

In their study of early poetry the Romanticists naturally revived and modified old verse forms. The movement towards a free versification was inaugurated, and has continued, until to-day English poetry is richer in verse forms than ever before. The English vocabulary has also been renovated. Into prose romance came, with Scott and his school down to Stevenson, old words and expressions, and the poets have ventured upon new and felicitous compounds. Perhaps the greatest gain to our language from romanticism has been the choice of words for their rich coloring and sounds.

In other countries the course and the results of romanticism were much the same as in England. The French date the beginning of the movement with Rousseau's cry of a return to nature (c.1750), and follow it through Chateaubriand to Victor Hugo and a group of his contemporaries. In her book on Germany (*De l'Allemagne*, 1810) Madame de Staël described for her classic compatriots the wonders of romantic literature in Germany. In his preface to *Cromwell* (1827) Hugo defended against classicism the grotesque in art, declaring it to be "one of the supreme beauties of the drama," and condemned the unities of time and place. He and his associates enriched the current literary vocabulary, freed French classic metre from its trammels, and recovered forgotten stanzas.

French romanticism owes much to England, and Shakespeare seems to have been more often in the thoughts of Hugo and his circle than Rousseau. *Hernani* (1830) was constructed in the Shakespearean spirit, and it aroused more hostility and enthusiasm than any other play by Victor Hugo. The French Romanticists sought their inspirations far and near. Searching the literature of other nations, they extended the intellectual boundaries of France.

In Germany the first announcement of romanticism was in 1773, when there appeared a collection of essays by Möser, Herder, and Goethe, entitled *Von deutscher Art und Kunst: einige fliegende Blätter* (Loose Leaves on German Style and Art); great praise was bestowed on German folk songs, Shakespeare, and Gothic architecture. The same year Goethe published *Götz von Berlichingen*, an historical drama, of which the hero is a robber knight of the sixteenth century. Schiller also felt the romantic impulse at the beginning of his literary career. But Goethe and Schiller soon outlived their youthful extravagances, and in reaction from their classicism in the narrower sense of the term there arose the German Romantic school, of which the official organ was the *Athenäum*, founded in 1798 by the Schlegels. Among other Romanticists were Tieck and Novalis; and later, forming a second Romantic school, were Arnim, Brentano, the Grimms, and Uhland.

Like Chamisso, Heine composed ballads and allowed his mind to wander in a dream world. His poetic landscapes and his poetic incidents are romantic. In the unfinished epic *Tristan und Isolde* Immermann endeavored to quicken mediæval poetry. Gustav Freytag sought to breathe life into mediæval dust in *Die Ahnen;* Victor von Scheffel succeeded charmingly in his story of *Ekkehard*, and mediæval literature has since been cultivated, translated, and adapted by men like Wilhelm Hertz and Paul Heyse. That romanticism began in Germany, as has so often been asserted, is a theory which does not admit of demonstration. We cannot rightly honor any one country as the home or any one man as the founder of romanticism. Like realism (q.v.) and idealism romanticism is a tendency, and we can find it not only in a Victor Hugo or a Wordsworth, but in a Cervantes or in the adventures of Odysseus.

Romanticism was everywhere—in England, France, Germany, Scandinavia, and Russia—a revolt from literary tradition of every description. Its boldest champions proceeded untrammeled to choose themes from whatever source pleased them; to give free rein to caprice, fancy, and passion; to disregard the classic restraints of order, lucidity, and proportion; and they further demanded that the product should be judged by itself, irrespective of what somebody else had done. Though no one country can definitely claim the glory of the achievement, the awakening took place earliest in England. In literature the results have been greatest for England and France. Germany's poets of the first rank did not belong, strictly speaking, to either of her Romantic schools. On the other hand, from one of the impulses of romanticism—the revival of heroic legend—has come, it is perhaps safe to assert, that wider movement which has culminated for Germany in national unity.

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ROMAN'TIC SCHOOL OF MUSIC. See MUSIC, HISTORY OF, XXVI.

ROMANU. See ROMAN.

ROMA'NUS. The name of four Byzantine emperors.—ROMANUS I LECAPENUS was Emperor from 919 to 944. He was born in Armenia of poor parents. He entered the Imperial fleet, was high admiral on the accession of Constantine VII Porphyrogenitus, and by intrigue became Augustus in 919. His reign was filled with war; the Bulgarians were bought off in 926 and again a few years after; and in 941 Romanus was victorious over a great Russian fleet under Igor. In 944 Constantine formed a league with Romanus' two sons, deposed him, and forced him into a monastery, where he died after four years (948).—Constantine's son, ROMANUS II (c.938–963), succeeded his father in 959. He lived a life of ease, but was poisoned by his wife, Theophano. His granddaughter Zoë was married by her father, Constantine VIII, to ROMANUS III ARGYRUS (c.968–1034), who was compelled to divorce his first wife and assume the Empire in 1028. With an excellent policy, he was unsuccessful for lack of administrative ability. It is supposed that he was murdered by Zoë in order to secure the Empire for her lover, Michael the Paphlagonian.—ROMANUS IV DIOGENES (?–1071) made attempts to revolt under Constantine Ducas, and after the latter's death was arrested on the charge of plotting against Eudocia, Constantine's widow, whose passion for him as soon as she saw him rescued Romanus from death and brought him to the throne (1067). After a few years of successful war against the Seljuks, he was defeated by Alp-Arslan (q.v.), and was killed in the same year by a revolutionary party in Constantinople. Consult Edward Gibbon, *Decline and Fall of the Roman Empire*, vols. v–vi, edited by J. B. Bury (new ed., London, 1912).

ROMAN WALL. The remains of the lines of defense erected by the Romans to protect the northern boundary of Britain. We first hear of such defenses against the tribes of Caledonia when Agricola built a chain of forts to secure his conquests north of the Clyde. Of these, however, few, if any, traces remain, unless in a fort at Camelon, near Falkirk. Across the narrow neck, about 35 miles in width, between the Firth of Forth and the Firth of Clyde, under the Emperor Antoninus Pius, about 142 A.D., was built a rampart of turf, with a broad ditch on the north and a military road on the south. A chain of 18 forts furnished stations for the garrisons. This line was held for less than 50 years. Of it nothing remains, as the result of the building of a canal and of the railroad to Glasgow. After the abandonment of the rampart of Antoninus Pius, the Romans fell back to a southern line, already established by Hadrian, which crossed the island from the Solway to Newcastle-on-the-Tyne. Here about 120 A.D. there was a similar turf rampart, about 80 miles long, protected by a ditch. Nearly 90 years later Septimius Severus replaced this by a stone wall, which followed in general the same course. This wall can still be easily traced. South of it ran the *vallum*, a broad ditch with a low mound on each side. It had no military purpose, but was apparently a boundary mark. South of this was a chain of detached forts connected by a road and with castles and watch towers at intervals. Consult *An Account of the Roman Antiquities Preserved in the Museum at Chesters, Northumberland* (London, 1903), for the excavations at various sites along the line of the Roman Wall, and J. H. Westcott, "The Roman Wall in Britain," in the *Classical Weekly*, v, 18–20 (New York, 1911).

The term Roman Wall is also sometimes applied to the Limes Romanus (q.v.). This work was really in two sections. One, forming the northern boundary of Rhætia, ran from Hienheim on the Danube, near Regensburg, almost due west to a point near Stuttgart; the other, starting from the Rhine, nearly opposite Rheinbrohl, ran at first southeast and then more to the south until it joined the Rhætian line. At first both were little more than a palisade and ditch, with a second line of wooden towers and fortified camps. Later the line of upper Germania was defended by an earthen rampart, and that of Rhætia by a stone wall. Stone camps and towers replaced the wooden structures of the second line. Similar forts defended the line of the Danube along Pannonia and Noricum, though here no outer boundary line was needed.

ROMBERG, rôm'bĕrk, MORITZ HEINRICH (1795–1873). A German pathologist and neurologist, born in Meiningen. He studied in Berlin (M.D., 1817) and established himself there. Admitted to the faculty of his alma mater as lecturer in 1830, he was 15 years later appointed professor of pathology, a chair which he occupied until his death. Romberg's thesis *De Rachitide Congenita* (1817) was the first treatise on the normal process of ossification in cartilage dating from intrauterine life. But his most important work was *Lehrbuch der Nervenkrankheiten* (1840–46; 4th ed., 1857), the first textbook on nervous diseases, a classical work, which contains the original diagnostic description of ataxia and with it the well-known pathognomic sign (Romberg's sign) that ataxics cannot stand upright with their eyes closed and feet together. He also described facial hemiatrophy (Romberg's disease), with Romberg's spasm (lockjaw occurring in facial spasm). By Romberg's sign is understood lancinating pains on the inner side of the leg, due to compression of the obturator nerve, in gluteal hernia. Romberg's syndrome is a condition similar to shock caused by dilation of the blood vessels in the abdomen. The *Lehrbuch* was translated into English by E. H. Sievekind as *A Manual of the Nervous Diseases of Man* (1853).

ROMBLON, rôm-blōn'. A group of islands forming a separate province of the Philippine Islands. The group belongs to the Visayas and is situated in the centre of the Visayan Sea east of Mindoro and north of Panay (Map: Philippine Islands, D 4). The principal islands with their areas in square miles are: Tablas (324) in the west, Sibuyan (171) in the east, and Romblon (37) in the centre; the total area of the province is 573 square miles. The islands are highly mountainous, with a number of peaks over 2000 feet high in Tablas, while the peak

of Sibuyan, in the island of Romblon, has a height of 6424 feet. The greater portions are covered with forests containing valuable woods, but wholly unexploited, except that a little gum mastic and copra are exported from the island of Romblon; about one-sixth of the area is cultivated. Cattle are also raised and exported from the latter island, but throughout the province agriculture and other industries are engaged in only to supply the absolute necessities of home consumption. Pop., 1903, 52,848, mostly Visayans, and all classed by the census of 1903 as civilized. Capital, Romblon, with a well-sheltered harbor and a population of 10,095 in 1903.

ROME (Lat., It. *Roma*, Gk. Ῥώμη, etymology unknown). The capital of the Kingdom of Italy and of the Province of Rome, the third largest city in the country, the population having been in 1870, 226,022; 1881, 284,544; 1901, 424,860; 1911, 542,123; and in 1915, 590,960. The city lies on the plain on each side of the winding Tiber, mainly on the eastern or left bank of the river, and on the slopes of the historic hills (Map: Italy, D 4). Its geographical position at the observatory of the Collegio Romano is lat. 41° 53′ 52″ N., long. 12° 28′ 40″ E. Its situation in the Campagna (q.v.), about 14 miles from the Apennines and the same distance from the Mediterranean, is naturally unfavorable to health, but Rome is now considered one of the most sanitary cities in Europe. The death rate fell from 30 per 1000 in 1876 to 26 in 1885 and to less than 18 later. The climate is less extreme than in Florence and Milan; the thermometer seldom rises above 99° F. or falls below 23°. The mean temperature in January is 44°, in July 77°.

Modern Rome. The modern city, situated on the many-bridged Tiber and dignified by its many and historic gates, is distinguished by its vast ruins, its remains of ancient walls, its numberless public statues and monuments both new and old, its fountains, and the magnificent improvements which have been made since Italy became a united kingdom. The Tiber has been inclosed in embankments of masonry, streets have been widened, filthy districts done away with, and pleasure grounds laid out. The Palatine Hill (q.v.) is now a public park; the Janiculum (q.v.) has been converted into drives and walks; and the Villa Borghese (q.v.) and gardens have been acquired for the metropolis. The historic present wall of the city is for the most part that of Aurelian, dating mainly from about 275. (See AURELIAN, WALL OF.) This wall is, of course, of no value for defense. Rome is fortified by a wide circle of detached forts. The circumference of the city is about 15 miles. There are 10 bridges, three of which are for the most part ancient. Of these the five-arched bridge of Sant' Angelo is the best known.

Rome consists of four sections or districts, three on the left bank: (1) the Campus Martius, in the north, (2) the ancient southern portion, (3) the more modern city, on the northeast and the east, and (4) one district on the right bank. Mediæval Rome grew up, not on the hills, but on the old Campus Martius and across the Tiber, around St. Peter's and the Vatican; these two districts remain to-day the most densely settled parts of the city. By far the larger, the Campus Martius occupies all the plain between the walls of Aurelian, the Pincio, Quirinal, and Capitoline hills and the river. At its northern extremity, within the Porta del Popolo, is the handsome Piazza del Popolo, in which stands an obelisk brought to Rome by Augustus from the temple of the Sun at Heliopolis. The Santa Maria del Popolo Church adjoins this Piazza. It was rebuilt at the close of the fifteenth century and contains frescoes by Pinturicchio. Through the Campus Martius district runs the important and historic Corso from the Piazza del Popolo south-southeast for about a mile to the Piazza di Venezia near the foot of the Capitoline Hill. It corresponds to the ancient Via Lata, continued outside the city by the Flaminian Way (q.v.). It is lined with splendid palaces, churches ancient and modern, and fine shops, baroque architecture being in evidence. At its southern end, in the Piazza di Venezia, against the Capitoline Hill, is the monument of Victor Emmanuel II, designed by Giussani Sacconi. It was begun in 1885 and finished in 1912. It is over 200 feet high and includes an equestrian statue of the King in the centre of a plateau surrounded by colonnades and reached by massive flights of steps. The colonnades, whose columns are 50 feet high, are richly decorated with mosaics and paintings.

The Piazza di Venezia takes its name from the adjacent Palazzo Venezia, a Florentine structure of the fifteenth century, built of stones from the Coliseum. In this part of the city the Italian Senate and Chamber of Deputies hold their sessions, and here are found also various government offices and the University of Rome. The Pantheon (q.v.) is the only ancient building in Rome still practically complete. The splendid Piazza Colonna on the Corso lies to the northeast of the Pantheon and is the centre of modern Roman life. In it rises the fine ancient column of Marcus Aurelius, 95 feet high. (See ANTONINE COLUMN.) Not far away is the elegant Sciarra-Colonna Palace, scarcely surpassed even in Rome. It dates from the early part of the seventeenth century. Two historic piles in the vicinity are the Palace Torlonia and the Palace Bonaparte, where the mother of Napoleon lived and died. Near by is the superb Palace Doria, with its noteworthy collection of paintings. To the east is the well-known Colonna Palace, dating from the early fifteenth century, with a good picture gallery with some fine landscapes by Poussin. Some distance northwest, near the Tiber, stands the Palace Borghese, with its colonnaded court. To the southwest of this is the Sant' Agostino Church, dating from 1479, the first church in Rome with a dome. Just southeast of the Pantheon is the Santa Maria sopra Minerva Church, begun in 1285 and renovated in recent times. It contains Michelangelo's sublime "Christ and the Cross." West of the Pantheon is the Piazza Navona, with three fountains. Near it rises the Santa Maria della Pace Church, due to Sixtus IV (1484). In one of its chapels are the Sibyls of Raphael, painted in 1514. Bramante built the fine cloisters. South of the Pantheon is the Gesù, the sumptuous church of the Jesuits, begun in 1568. West of it stands the interesting Sant' Andrea della Valle, dating from 1591. Still farther west rises the imposing Renaissance Palace della Cancelleria, finished in 1495. Just south is a business centre—the Piazza Campo di Fiore, with a fine bronze statue of Bruno, erected in 1889 on the spot where he was burned. To the east stood the Theatre of Pompey. (See POMPEY'S THEATRE.) Southwest, near the Tiber, is the splendid Farnese Palace, completed in

THE COLISEUM

1545. It was constructed, in part, by Michelangelo. Some distance to the east is the Piazza Tartaruga, containing the bronze Fountain of the Tortoises, dating from 1585. In this vicinity was also the Ghetto (q.v.) after 1556. Here also is found the Cenci-Bolognetti Palace, where dwelt the sad-famed Beatrice. Near by is the noteworthy Porticus of Octavia, dating from the time of Augustus.

The southern part of that portion of the modern city which lies on the left bank of the Tiber formed the site of ancient Rome. Here are the Palatine, Aventine, and Cælian hills, covered with ruins, also parks, gardens, vineyards and orchards, churches and convents. (See AVENTINE; CAPITOL; PALATINE HILL.) All this region is now sparsely inhabited. The top of the Capitoline Hill, approached from the Campus Martius by magnificent staircases, is one of the most impressive spots in Rome. The majestic square of the Capitol was planned by Michelangelo. Among its minor objects of interest are an ancient group of the horse-taming Dioscuri, the celebrated bronze equestrian statue of Marcus Aurelius, and the first milestone of the old Appian Way. The Santa Maria Ara Coeli Church, here, contains a famous Holy Child (Bambino, q.v.). The Palace of the Conservatori (on the Capitoline) contains the New Capitoline Museum, in which are many worthy ancient sculptures. Here, too, is the far-famed Capitoline Wolf (q.v.), probably the one that was struck by lightning (65 B.C.). The Capitoline Museum (q.v.) of sculpture is also here. The Palace of the Senators, where is housed the civic administration of the city, has features by Michelangelo. This was the site of the ancient Tabularium (q.v.). The Tarpeian Rock (q.v.) was on the south side of the Capitoline Hill. Towards the northern extremity of this side of the Capitoline Hill lay the famous Mamertine Prison (q.v.). To the east-southeast of the Capitoline extends the long site rich with the ruins of the Roman Forum (see FORUM, *The Forum Romanum*). On the south side of the Forum rises the Palatine Hill (q.v.). Of the isolated columns now standing in the Forum, those of the temple of Castor and Pollux are the most beautiful. The only construction here remaining practically in perfect condition is the arch of Septimius Severus, dating from 203 A.D. Farther on towards the Coliseum rise three vast and impressive arches of the ancient basilica of Constantine. To the southeast stands the fine arch of Titus, with reliefs, dedicated 81 A.D. East of the arch at some little distance away rises the ruin of the magnificent Coliseum. (See AMPHITHEATRE.) It stands in the ancient gardens of Nero's Golden House. Southwest is the triumphal arch of Constantine, constructed in 312.

North of the Roman Forum were the magnificent fora of the emperors. (See FORUM, *Imperial Fora;* AUGUSTUS, FORUM OF; FORUM JULIUM; FORUM PACIS; NERVA, FORUM OF; TRAJAN, FORUM OF.) In the northwestern part of the superb forum of Trajan rises Trajan's Column (q.v.). Its reliefs contain 2500 human figures.

On the Palatine Hill (q.v.) are the vast ruined surface constructions and substructures of the palaces of the emperors. This was the site of the Roma Quadrata. Parts of its walls are still to be seen. The excavations here, as in the fora, have been extensive and costly. The chief ruins seen on the hill are those of the palace of Tiberius; the house of Livia, the wife of Augustus, a most interesting edifice, with unexcelled frescoes; the Palace of Augustus; the so-called Stadium; and the Pædagogium, or school for the slaves of the emperors. At the western foot of the Palatine is the Janus Quadrifrons (q.v.). Under this district passes the ancient Cloaca (q.v.) Maxima from the Forum. It still discharges into the Tiber near by. Near its emptying point is an attractive little marble circular temple with 20 Corinthian columns. Close by is another ancient temple, Ionic in style, now the church of Santa Maria Egiziaca. To the southeast and along the southwestern foot of the Palatine Hill formerly stretched the immense Circus Maximus. See CIRCUS.

The adjoining Aventine district is covered with monastic institutions and picturesque old gardens. Of the three churches on the crown of the Aventine the Santa Sabina is most important. It dates from 425 A.D. and was the headquarters of St. Dominic and his brotherhood. Near by is to be had the famous peep hole view of the dome of St. Peter, through a hole in the door of the villa of the Priorato di Malta. Some distance to the southwest from the Aventine Hill, in a bend of the Tiber, rises Monte Testaccio, a solitary mound 115 feet high. It was formed of broken earthen jars, which came chiefly from Africa and were unpacked in the vicinity, and attests the volume of transmarine commerce carried on at the Tiber wharves close by. To the east, near by, is the well-known Protestant cemetery of Rome. Here are buried Shelley, Keats, Trelawney, J. A. Symonds, and John Gibson. Not far away is the ancient pyramid of Cestius, the tomb of the Prætor Cestius Epulo. (See CESTIUS, PYRAMID OF.) In the section of the city southeast of the Palatine extends the ancient Via Appia, now transformed into a modern street, on which the ruins of the baths of Caracalla (q.v.) are soon reached. Farther along are various old Roman tombs and columbaria, showing ancient burial customs. (See COLUMBARIUM.) Especially interesting is the columbarium of the freedmen of Octavia, Nero's wife, with its niches and stucco decorations and colors. North of this region and east-southeast of the Palatine is the district of the Cælian Hill, with its various churches and religious associations, which date from the time of the Apostles. At its western foot is the San Gregorio Magno Church, noted for its rôle in the lives of St. Gregory and St. Augustine. In the vicinity is the little church of Santi Giovanni e Paolo, dating from 400 and restored in the latter half of the nineteenth century.

The district north of the Cælian and east from the Coliseum is that of San Clemente and the Lateran. The basilica of San Clemente, just east of the amphitheatre, is handsomely preserved. Underneath are the remains of the original church, dating from the fourth century. This lower church was large and its frescoes are of value. The upper church is also striking. The extensive St. John Lateran basilica, with its square and approaches, is very impressive. In the centre of the square stands a red obelisk from Thebes—the largest obelisk in Europe. On the left is the Lateran Museum, occupying the former residential palace of the popes. Opposite the museum and across the square is the baptistery, the first in Rome. The interior is decorated with mosaics and frescoes. In the church itself may be observed a Gothic canopy and mosaics

by J. Torriti. The cloisters of the thirteenth century are fine. Just northeast of the Lateran is the edifice which contains the well-known Scala Santa and the former chapel of the popes. (See LATERAN, CHURCH AND PALACE.)

The most modern region of Rome, northeast and east of the Campus Martius and beyond the Corso, covers the slopes and plateaus of the Pincian, Quirinal, Viminal, and Esquiline hills. Here the city presents the usual appearance of a continental metropolis. East of and adjoining the Piazza del Popolo rises the garden-covered Pincian Hill (q.v.). The gardens of Lucullus were here. (See LUCULLUS, GARDENS OF.) The grounds are everywhere embellished with statues, etc. Here is situated the Villa Medici, dating from 1540, in which the French Academy of Art has been housed since 1801. The Piazza di Spagna, the centre of the foreign life in Rome and of the artists' quarter, is near by. To it descends the imposing Scala di Spagna (1725) in 137 steps. Near the royal palace, situated to the southeast, is the grand Fontana Trevi, the most famous fountain in Rome. It dates from 1762. Northeast of the palace is the Piazza Barberini, with Bernini's fine fountain of the Tritons. The Barberini Palace (q.v.) is adjacent. Farther northeast stands the Palazzo Piombino, with the Boncompagni Museum of antiques, including the famous head of Juno—Juno Ludovisi—and other fine examples. This vicinity was occupied by the gardens of Sallust. (See SALLUST, GARDENS OF.) The neighboring Quirinal Palace, the abode of the King, belongs to the last part of the sixteenth century. (See QUIRINAL.) Directly south is the interesting Rospigliosi Palace, dating from 1603. In its adjoining casino is the famous "Aurora" of Guido Reni—a ceiling painting. See ESQUILINE HILL; PINCIAN HILL; QUIRINAL; Plate with RENI.

A long street follows the top of the Quirinal ridge from Monte Cavallo, the square in front of the royal palace (so called from the colossal ancient statues of Castor and Pollux with their horses, cavalli, that stand here), northeast to the Porta Pia in the city walls. This street is called Via del Quirinale in its lower part, then Via Venti Settembre. On it are the offices of the ministries of War and Finance. South of this street and running parallel with it is the Via Nazionale, the most important street of the modern city. All this handsome new region is traversed by straight magnificent avenues reaching in all directions. Near its centre are the baths of Diocletian (q.v.), where is located the Santa Maria degli Angeli Church. Southwest is the modern building of the National Gallery of Modern Art, to the southeast of which stands the Santa Pudenziana, the oldest church in Rome. In the vicinity rises, in a spacious square, the imposing Santa Maria Maggiore (q.v.). To the south lay the gardens of Mæcenas, and not far away may be seen remains of the Servian Wall (q.v.). Quite a distance to the east is the noteworthy pilgrimage church San Lorenzo fuori le Mura, rebuilt in 578. Just south of the Maria Maggiore is the early Santa Prassede. To the southwest is San Pietro in Vincoli, founded in the middle of the fifth century and containing Michelangelo's "Moses." Among the well-known villas in northeastern Rome the Borghese, with its art collections and beautiful grounds, is justly the most famous. The villa dates from the early part of the seventeenth century. The grounds are enriched with statues, fountains, miniature temples, etc. The splendid collections include Titian's "Sacred and Profane Love."

That part of the modern city of Rome which lies on the right or western bank of the Tiber may be divided into three parts—the Vatican quarter, otherwise called il Borgo, the Trastevere proper, and the Prati di Castello. The Borgo, or Leonine city, inclosed in a wall of its own in 848–852 by Leo IV, extends between St. Peter's and Sant' Angelo. (See HADRIAN, TOMB OF.) Sant' Angelo rises at the north end of the bridge of Sant' Angelo, which crosses the Tiber near the western end of the Campus Martius. The Prati district lies to the north and is a modern quarter, largely of apartment houses. The circular castle of Sant' Angelo is surrounded with ramparts, moats, and bastions and mounted with cannon. It is both imposing and picturesque and has for some 15 centuries been regarded as the fortress of Rome, figuring prominently in all the mediæval warfare of the city. When it was in the hands of the popes they connected it with the Vatican (q.v.) by an underground passage. Certain of the apartments are decorated, and the visitor is shown where Cellini and Beatrice Cenci were imprisoned. On the way to the Vatican stands the Giraud Palace, dating from 1503. The Borgo has been closely associated with papal history, but is not in itself very interesting. Immediately to the west, on the slopes of the Monte Vaticano, loom St. Peter's and the Vatican. See SAINT PETER'S CHURCH; VATICAN.

South of St. Peter's and along the Tiber and the Janiculum (q.v.) range of hills extends the Trastevere (q.v.). It is connected with the St. Peter's district by the Via della Lungara, close to the river, and by the Strata della Mura, along the heights. In the monastery of Sant' Onofrio, in the northern part of the Trastevere, Tasso lived for a time and died. Farther on, near the right, is the magnificent Villa Farnesina with its gardens. It has decorations designed by Raphael and executed by Giulio Romano and others. Twelve of these form the Myth of Psyche —of rarest value. The villa also contains Raphael's "Galatea." Opposite, on the west, is the Palace Corsini with fine gardens. Near by is the Museum Torlonia, with a collection of antiquities. Some distance southeast of the Museum Torlonia, on the elevation, is the church of Santa Maria in Trastevere. Farther on to the southeast is the Santa Cecilia in Trastevere. From the top of the Janiculum, along which run fine drives, may be had splendid views of Rome across the Tiber. On the Janiculum, west of the Trastevere church, is the church of San Pietro in Montorio, marking the place where it is claimed that St. Peter was martyred. In the grounds of its monastery is a little round Doric tempietto, designed by Bramante. It is situated on the spot where St. Peter's cross is supposed to have stood. Some distance to the west is the fine Villa Doria Pamphili.

Rome is not important as an industrial and commercial centre. The art manufactures are, however, prominent and consist in part of bronzes, terra cottas, mosaics, cameos, artificial pearls, and church ornaments. Other manufactures are leather, silk, umbrellas and parasols, strings for musical instruments, artificial flowers, candles, soap, flour, macaroni, fertilizers, and glue. A flourishing industry is the making of copies of famous paintings. In the Vatican is the papal manufactory of mosaic, where copies

of famous pictures are executed in colored glass. The government has a large tobacco factory in Rome. The largest imports are grain, cattle, and wine. The Tiber is canalized in the city, but its port suffices only for small river craft.

Rome is the seat of the Italian government and of the Pope and the College of Cardinals. (See CARDINAL.) The head of the municipal government is the syndic, or mayor, chosen by the 80 members of the municipal council, who are themselves elected by the people. The giunta is an administrative body, consisting of the mayor and 10 members (assessori), who preside over the departmental committees. For purposes of administration the city is divided into 15 districts. It forms five parliamentary circles. The streets are lighted principally by electricity. There are electric street railways and a fire department. There are also municipal markets and baths and a municipal slaughterhouse, bakery, cemetery, crematory, and pawnshop. Rome is unequaled perhaps for its fine and abundant water supply. The building regulations of Rome, adopted in 1887, are exceedingly strict. They make ample provision for light and air and have had a marked effect upon the kinds of houses erected. They forbid the destruction, even by the owners, of buildings of historic or artistic interest.

The interesting features in the environs (see CAMPAGNA DI ROMA) not already mentioned are: the Villa Albani, on the northeast, with an art collection; farther on, the Sant' Agnese fuori le Mura Church, built over the tomb of the saint and restored in 1856; the catacombs (q.v.); the Domine Quo Vadis (q.v.) Church, on the Appian Way, southeast of the city; farther on, the Circus of Maxentius (see MAXENTIUS, CIRCUS OF) and the tomb of Cæcilia Metella (q.v.); and the San Paolo fuori le Mura Church, south of the city. This church was called the most attractive one in Rome before the fire of 1823. It has been rebuilt in splendid style.

Under the monarchy the Roman educational system has been thoroughly reorganized. Besides the university (see ROME, UNIVERSITY OF) there are the College of the Propaganda, founded in 1627, with theological and philosophical faculties; the Pontificia Accademia dei Nobili Ecclesiastici, designed to give preparation for administrative and diplomatic careers; the Collegio Germanico-Ungarico; the Jesuit Collegio Romano; a Collegio Rabbinico; an Institute Talmud-Tora: a Collegium Bohemicum; two Collegii Teutonici; a conservatory of music; a school of architecture and the plastic arts; four municipal licei; four public ginnasi, etc. Among the numerous academies and art and science institutes and associations are the Accademia degli Arcadi, the Royal Academy of Sciences, the Società di Belle Arti. Nearly all the leading countries are represented by schools, including the American schools of architecture and of classical studies, recently combined to form the American Academy, with headquarters in the Villa Aurelia, on the Janiculan side of the Tiber.

The museums of Rome are vast and invaluable, especially the art and archæological collections. (See above; CAPITOLINE MUSEUM; VATICAN.) The Capitoline Museum contains the Capitoline Venus and the mosaic "Doves on a Fountain Basin," brought from Hadrian's Villa. The Lateran Museum possesses the portrait statue of Sophocles, discovered in 1838. Among the masterpieces in the National Roman Museum of Antiquities (Museo Nazionale Romano delle Terme Diocleziane, or, briefly, Museo delle Terme) are a statue of Hera and a marble statue of a kneeling youth, the latter an original Greek work. The National Corsini Gallery, with engravings and drawings, is likewise meritorious. The Collegio Romano contains the Museo Kircheriano, founded in 1601, with its prehistoric and ethnographical collections which throw light on life in early Italy. Here is preserved the treasure of Præneste—gold, silver, and other objects discovered in a tomb in 1876.

Rome is rich in libraries. Important collections are the Biblioteca Nazionale Centrale Vittorio Emmanuele, with about 350,000 volumes and 6200 manuscripts, formed in 1871 from the libraries of the Jesuits and suppressed convents; the Vatican library, containing 250,000 volumes and 26,000 manuscripts; the medical Biblioteca Lancisiana; the library in the Corsini Palace, with about 70,000 volumes; the library in the Barberini Palace; the government's Biblioteca Casanatense (112,000 volumes and about 5500 manuscripts); the Biblioteca Angelica (150,000 volumes). The national archives are housed in the cloisters of the Santa Maria di Campo Marzio. Except Milan Rome is the most important city in Italy for music and the drama.

The charitable activities, both civic and Catholic, are on a large scale. The 300 organizations under the control of the board of charities have property to the value of some $20,000,000. Of these organizations 150 give *dots* to marriageable young women, 11 have other special aims, 55 disperse general charity, the rest are hospitals and asylums. Near the Lateran is an important hospital for women. The hospital of San Michele has a government working school for children.

Popular festivals of interest are the carnival from the second Saturday before Ash Wednesday to Shrove Tuesday, the October festival in the vintage season, celebrated outside the gates with singing and dancing, the national festival of the constitution on the first Sunday in June, and the anniversary of the foundation of Rome on April 21.

Ancient Rome. Until recently it has been the current opinion, based on the unanimous testimony of ancient writers, that the first settlement was upon the Palatine Hill (q.v.), an isolated summit rising only about 140 feet above the level of the Tiber and at that time flanked on two sides by marshy pools connected with that river. Since 1903, however, several scholars have held that the organized city of Rome arose from a union of autonomous hamlets, situate on the several hills, none of which could claim priority of settlement or authority over the others. (See Platner's book, named below in the bibliography, pp. 44–45, and Binder, *Die Plebs*, 1–170, Leipzig, 1909.) The older view still holds its ground. (See below, under the heading *History*, Earliest or Regal Period, second paragraph.) The first settlement was called Roma Quadrata, being laid out foursquare. The next stage in the development of the city was the inclusion of the neighboring hills (*montes*), Cælius and Esquilinus, within the city limits and the organization of the territory as seven hill districts (the Septimontium, not to be confused with the so-called seven hills of Rome of later days). Three of the seven districts were connected with the Palatine—Palatium, Cermalus (the western corner and slope of the Palatine), and Velia (the outlying ridge

running northward towards the Esquiline, into the valley afterward occupied by the Forum). Three were connected with the Esquiline—Cispius (its northern summit), Oppius (its southern summit), and Fagutal (a western shoulder of Oppius). The seventh district was the Sucusa on the Cœlian Hill, whose special duty it was to lend its aid against attacks by the people of Gabii (q.v.), who dwelt a few miles eastward from Rome. Later, according to the common view, a body of Sabines pushed southward from their hill dwellings, seized a well-defended position on the Quirinal Hill, and had more or less fighting with their Latin neighbors of the Septimontium until a coalition of the Latin and the Sabine elements was finally effected. (For vigorous opposition to this view, see Th. Mommsen, *History of Rome*, i, 83–87, Eng. trans. by W. P. Dickson, New York, 1883, and Binder, *Die Plebs*, 139–170.) The heights of the Quirinal and the Viminal hills (called *colles*, not *montes*), with the Sabine settlers, were now incorporated within the city, which was organized into four regions—(1) Regio Sucusana (later Regio Suburana), which included the Cœlian Hill, with the valley and the rising ground northwestward around the Cispius, as well as the valley (Subura) between the *montes* and the *colles;* (2) Regio Esquilina, including substantially the three Esquiline districts of the Septimontium; (3) Regio Collina, including the two Sabine *colles*, Quirinal and Viminal; and finally (4) Regio Palatina, including the three Palatine districts (*montes*) of the *Septimontium.* Moreover, another *mons*, the Capitoline, at that time joined by a ridge to the Quirinal, but lying near the Tiber, was taken as the common citadel of the community and a common temple to Jupiter was built upon it. (See CAPITOL.) The valley between the Capitoline and the north corner of the Palatine, just free from the Velabrum inlet of the Tiber at low water, but crossed by a brook, with a number of tributary springs, that rose in the Subura, and subject for centuries (and even now) to frequent inundations from the rising Tiber, was gradually drained and made the common market place (*Forum*, q.v.) of the community and the meeting place of its courts and legislative assemblies. King Servius Tullius (q.v.) was said to have added to the city of the Four Regions a triangular strip of plain behind the Esquiline and to have built a wall (see SERVIAN WALL) which included not only the Four Regions, with the Capitol and the Forum and the new addition to the Esquiline, but also another hill (*mons*), the Aventine, lying to the south and west of the Palatine and close to the Tiber. But this hill remained for centuries outside the formal city limits (*pomœrium*, q.v.), the advancement of which from these really prehistoric times did not keep progress with the growth of the actual settlement. About this time also a wooden bridge supported on piles was thrown across the Tiber from the open space (*Forum Boarium*) between Capitol, Palatine, and Aventine, and a fort was constructed on the height of Mons Janiculus on the right bank, whence a constant watch was kept for warlike movements on the part of enemies of Rome, especially the Etruscans.

Although the *pomœrium* was not extended, Rome went on adding new territory in the neighborhood to her domain, and its organization into regions was replaced by an organization into tribes, of which the first four, the city tribes, were simply the old Four Regions. To these new country tribes were gradually added until the number of 35 was reached. But these tribes finally lost their territorial character and became mere voting classes, to one or the other of which each new Roman citizen was assigned. The population of the city was probably much reduced by the Gallic invasion (390 B.C.), and the haphazard rebuilding of the city after its destruction by that enemy left it with the narrow and crooked streets that were its curse for many centuries. But with the development of Rome's power, the cessation of hostilities in the immediate neighborhood, and the winning of new territory in the neighborhood, the agricultural population of Rome spread far beyond its walls on both sides of the Tiber, which was now crossed by two new bridges of stone besides the old pile bridge (Pons Sublicius; see SUBLICIAN BRIDGE). By the end of the Republic the old Servian Wall had been overrun in almost all directions and had even disappeared from view in great measure. The best opportunity for building was out on the Campus Martius, the parade ground, which lay between the Quirinal and the Capitol on the east and the great bend of the Tiber on the west. Accordingly, that became the site both of many private residences and of great public buildings of various sorts. Augustus divided the city for administrative purposes into 14 numbered regions, of which 13 were on the east bank of the Tiber and the fourteenth on the west; this division continued for centuries after his day. But the external limits of his city are difficult, if not impossible, to determine. They, however, extended in some directions beyond the later walls of the city. The population of the city reached its maximum in the early Empire, though the oft-quoted estimate of 2,000,000 is undoubtedly much too great. Consult W. W. Story, *Roba di Roma* (Boston, 1896); L. Friedländer, *Roman Life and Manners under the Early Empire*, vol. iv (London, 1913).

Rome had remained a defenseless city for centuries until the Emperor Aurelian (270–275 A.D.) began and Probus (276–281) finished a line of massive fortifications which, restored in 403 by Honorius and later by Belisarius and by a number of the popes and added to on the right bank by Leo IV (847–855) to include the great settlement around and near the basilica of St. Peter and the Vatican Palace, remain the present walls of Rome. (See AURELIAN WALL.) The walls of Aurelian doubtless aimed to include as far as possible the actually inhabited city, but were curiously irregular in outline, being carried, where possible, along the edges of elevations for additional inaccessibility from the outside and also to make use of older structures as far as possible. On the right bank, however, the fort on the Janiculum was connected with the Tiber by two lines of wall running northeast and southeast respectively to the nearest points of the river by about the shortest practicable route.

The internal commotions of Italy in the centuries immediately following and the devastation of the region by the barbarian invasions caused a great diminution in the number of Rome's inhabitants, and the cutting of the aqueducts led to the abandonment of residences on the higher ground and to the massing of the people upon the ground near the Tiber. So the Campus Martius and the Trastevere opposite became the centre of population through the Middle Ages

(and are still the most thickly settled portions of the city), while three-fourths of the city were given over to desolation and finally became the vineyards and gardens of the wealthy classes.

HISTORY

Earliest or Regal Period. According to the story of Romulus (q.v.) Rome was an offshoot from Alba Longa (q.v.). The city, however, probably sprang into existence as a frontier defense against the Etruscans and as an emporium for the river traffic of the country, but whether it was founded by a Latin confederacy or by an individual chief is beyond the reach of conjecture. The date fixed for the commencement of the city by the formation of the *pomœrium*, April 21, 753 B.C. (see PALES), is valueless. The three tribes, Ramnes, Tities, and Luceres, which appear in the Romulian legend as the constituent parts of the primitive commonwealth, suggest the idea that Rome arose out of an amalgamation of three separate cantons. The existence of a Sabine element, represented by the Tities, is indeed admitted, but its introduction is thrown back to a period long anterior to the foundation of the city, when the Roman clans were still living in their open villages and nothing of Rome existed but its stronghold on the Palatine. Nor is there anything to indicate that it materially affected the Latin character or the language, polity, or religion of the commonwealth which was subsequently formed.

That the Palatine Hill was the oldest portion of the city is attested by a variety of circumstances. (See above, *Ancient Rome*, first paragraph.) Not only does it hold that rank in the Romulian legend, but on it were situated the oldest civil and religious institutions. The Romulian myth of the establishment of an asylum on the Capitoline (see CAPITOL) for homicides and runaway slaves, with its sequels—the rape of the Sabine women, the wars with the Latins of Cænina, Antemnæ, and Crustumerium, and especially with the Sabines of Cures (q.v.) under their King Titus Tatius, and the tragic fate of Tarpeia—is historically worthless, except, perhaps, so far as it shows how from the beginning the Roman burghers were engaged in feuds with their neighbors for the aggrandizement of their power. The entire history of the regal period, in fact, has come down to us in so mythical and legendary a form that we cannot feel certain of the reality of a single incident. That such personages as Numa Pompilius, Tullus Hostilius, Ancus Martius, Lucius Tarquinius Priscus, Servius Tullius, and Lucius Tarquinius Superbus ever existed, or, if they did, that the circumstances of their lives, their institutions, their conquests, their reforms, were as the ancient narrative describes them, are things which no critical scholar can believe. The destruction of the city records by the Gauls when they captured and burned Rome in 390 B.C. deprived the subsequent chroniclers of authentic information and forced them to rely upon treacherous reminiscences, on oral tradition, on ballads, and on all the multifarious fabrications of a patriotic fancy that would naturally seek to invest with splendor the primeval history of the state.

From the very beginning the inhabitants were divided into two orders (exclusive of slaves), householders and their dependents, better known, perhaps, as patricians and clients. The former alone possessed political rights. They alone constituted the *populus* (the people); the clients had no political existence whatever. That the clients formed a body essentially different from the *plebs* is not true and seems based merely on the mythical account of what followed the destruction of Alba Longa by Tullus Hostilius. The name *plebs* is doubtless of later origin than *clientes;* but both are applicable to the same persons. The constitution of the state was simple. All the burgesses were politically on a footing of equality. From their own ranks was chosen the king (*rex*), who was therefore but an ordinary burgess—a husbandman, a trader, a warrior, set over his fellows. The *rex* held office for life; consulted the national gods; appointed the priests and priestesses; called out the *populus* for war and led the army in person; his command (*imperium*) was not to be gainsaid, on which account, on all official occasions, he was preceded by messengers or summoners, lictors (see LICTOR), bearing the fasces (q.v.), the symbols of power and punishment; he had the keys of the public chest, and was supreme judge in all civil and criminal suits. The Roman religion was from the first subordinate to the authority of the state; and all that we can infer from the myth of Numa (q.v.) is that Rome perhaps owed its colleges of augurs and pontiffs to the wisdom of some enlightened sovereign who felt himself at times embarrassed in his decisions on matters of religious and public law and recognized how valuable might be the aid afforded him by a body of sacred experts. Originally the sole power was the regal, and the subordinate magistracies of later times arose from a delegation of regal authority, rendered necessary by the ceaseless increase of state business. On the other hand, we may believe that the *senatus*, or council of the elders, from its very nature, was as old an institution as the monarchy itself. The elders gave their advice when the *rex* chose to ask it; that was all. Yet, as the tenure of their office was for life, they possessed great moral authority. Ten households formed a *gens* (q.v.); 10 clans, or 100 households, formed a *curia* (q.v), or wardship; and 10 wardships, or 100 clans, or 1000 households, formed the *populus, civitas,* or community. But as Rome comprised three cantons, the actual number of wards was 30, of clans 300, and of households, 3000. Every household had to furnish one foot soldier and every clan a horseman and a senator. Each ward was under the care of a special warden (*curio*), had a priest of its own (the *flamen curialis*), and celebrated its own festivals. None but burgesses could bear arms in defense of the state. The original Roman army, or *legio,* was composed of three hundreds (*centuriæ*) of horsemen, under their divisional leaders (*tribuni celerum*), three thousands of footmen, also under divisional leaders (*tribuni militum*), and a number of light-armed skirmishers (*velites*), especially archers (*arquites*). The *rex* was usually the general, but, as the cavalry force had a colonel of its own (*magister equitum*), it is probable that the king placed himself at the head of the infantry.

The foreign policy of Rome seems to have been aggressive from the first. We have no certain knowledge of the primitive struggles, but it appears from the legends that at a very early period the neighboring Latin communities of Antemnæ, Crustumerium, Ficulnea, Medullia, Cænina, Corniculum, Cameria, and Collatia were subjugated. The crisis of the Latin War, how-

ever, was undoubtedly the contest with Alba Longa (q.v.) which was destroyed and yielded its leadership to the conqueror, its inhabitants being transferred to Rome, where they were ultimately incorporated with the Roman burgesses. The wars with the Etruscans of Fidenæ (q.v.) and Veii (q.v.), assigned, like the destruction of Alba Longa, to the reign of Tullus Hostilius, were apparently indecisive; those with the Rutuli and the Volsci, however, were probably more fortunate; but uncertainty hangs like a mist over the narrative. Even the story of the Tarquins, though it belongs to the later period of the monarchy, is in many details incredible.

Meanwhile a great internal change had taken place in Rome. This is usually designated the Servian reform of the constitution, although it was only a reform in the mode of raising the army. Originally none but burgesses could bear arms in defense of the state; but the increase of the general population had totally altered the relation in which the nonburgesses, or *plebs*, originally stood to their political superiors. See PATRICIAN; PLEBEIANS.

The *plebs* could acquire property and wealth and could bequeath it with the same legal right as the *populus;* moreover, such of the Latin settlers as were wealthy and distinguished in their own communities did not cease to be so when they were amalgamated with the Roman multitude. It was therefore felt to be no longer judicious to let the military burdens fall exclusively upon the old burgesses while the rights of property were equally shared by the nonburgesses. Hence the new arrangement, known in Roman history as the formation of the *comitia centuriata.* (See COMITIA.) When or with whom the change originated it is impossible to say. The legend assigns it to Servius Tullius, predecessor of Tarquin the Proud; it was in all probability the work of some kingly ruler who saw the necessity of reorganizing the national forces. Every Roman freeholder from the age of 17 to 60, whether patrician or plebeian, was now made liable to serve in the army; but he took his place according to the amount of his property. The freeholders were distributed into five classes, and these classes, all of whom were infantry, were again subdivided into *centuriæ* (hundreds). The first class, which consisted of those who possessed property valued at 100,000 *asses* (units) or an entire hide of land (i.e., as much as could be worked with one plow), furnished 82 hundreds; the second, whose members owned property valued at 75,000 *asses* or three-quarters of a hide of land, furnished 20 hundreds; the third, whose members had property valued at 50,000 *asses* or one-half hide of land, furnished 20 hundreds; the fourth, with property valued at 25,000 *asses*, or one-fourth hide of land, furnished 20 hundreds; and the fifth, with property valued at 12,500 *asses*, or one-eighth hide of land, furnished 32 hundreds. These valuations in *asses* are given, it must be noted, by later writers in terms of their own period. There was no such wealth in private hands in Rome during the kingly period. A single hundred was, moreover, added from the ranks of the nonfreeholders, or *proletarii*, although it is possible that from the same order came the two hundreds of hornblowers (*cornicines*) and trumpeters (*tibicines*) attached to the fifth class. Two hundreds of *fabri*, a sort of engineer corps, were added to the 80 hundreds proper of the first class. Thus the infantry hundreds amounted to 175, i.e., 17,500 men, besides whom were 18 hundreds of *equites* (horsemen) chosen from the wealthiest burgesses and nonburgesses; so that the Roman army now numbered in all nearly 20,000 men. (See Livy, i, 43, and the commentators there.) This arrangement, though at first merely military, soon produced political results. Hence the Servian military reform paved the way for the great political struggle between the patricians and the plebeians, which commenced with the first year of the Republic (509 B.C.) and terminated only with its dissolution.

Roman Republic from its Institution to the Abolition of the Decemvirate. 1. *Internal History.*—According to the legend the expulsion of the Tarquins was brought about by Junius Brutus and Tarquinius Collatinus, in revenge for the outrage on the honor of Lucretia (q.v.), and was followed by the abolition of the monarchy (509 B.C.). The story may safely be taken as evidence that it was an unbridled lust of power and self-gratification that brought ruin on the Romano-Tuscan dynasty. We can make nothing definite out of the early years of the Republic. Dates and names and even reports of events must go for very little. We must content ourselves with the knowledge of tendencies and general results. The change from kings to consuls was not intended to diminish the administrative power of the supreme rulers, but only to deprive them of the opportunity of doing harm, and this it effectually succeeded in doing by limiting their tenure of office to a year and by numerous other restrictions. (See CONSUL.) About this time, in consequence of the new political changes, the old assessors of the king, such as the *quæstores parricidii*, formally became standing magistrates instead of mere honorary counselors, and the priesthood became a more self-governing and exclusive body. During the regal period the priests had been appointed by the king, but now the colleges of augurs and pontiffs began to fill up the vacancies in their ranks themselves (see AUGURIES AND AUSPICES; PONTIFEX), while the vestals and separate *flamines* (see FLAMENS) were nominated by the pontifical college, which chose a president (*pontifex maximus*) for the purpose. (See PONTIFEX.) The opinions of the augurs and the pontiffs became more and more legally binding. This is to be connected with the fact that in every possible way the patricians or old burgesses, now rapidly becoming a mere *noblesse*, were seeking to rise on the ruins of the monarchy and to preserve separate institutions for the benefit of their own order when they could with difficulty longer exclude the *plebs* from participation in common civic privileges. In the details given us of the Servian reform (see preceding paragraph) we can easily discern a spirit of compromise, the concessions made to the plebeians in the constitution and powers of the *comitia centuriata* being partially counterbalanced by the new powers conferred on the old burgess body, the *comitia curiata*, viz., the right of confirming or rejecting the measures passed in the lower assembly. The character of the Senate altered under the action of the same influences. Although it never had been formally a patrician body, although admission to it under the kings was obtainable simply by the exercise of the royal prerogative, yet nearly all the 300 Senators had always been patricians; but, after the institution of the Republic, we are told, the blanks

in the Senate were filled up en masse from the ranks of the plebeians, so that of the 300 members less than half were *patres* (full burgesses), while 164 were *conscripti* (added to the roll), whence the official designation of the Senators *patres* [*et*] *conscripti* (full burgesses and enrolled). See CONSCRIPT FATHERS.

As yet, however, the plebeians were excluded from the magistracies. They could vote, but they had no share in the administration. Only patricians were eligible for the consulship, for the office of prætor (q.v.) or quæstor (q.v.), or for any other executive function, while the priestly colleges closed their doors against the new burgesses. The struggle, therefore, between the two orders went on with ever-increasing violence. The traditional narrative clearly shows that the establishment of the Republic and the reconstitution of the burgess body only fostered discontent. Power virtually passed into the hands of the capitalists, and, though some of these were plebeians, yet they preferred their personal money interests to the interests of their order and coöperated with the patricians. The abuse by these capitalists of the *ager publicus* (see AGRARIAN LAW), together with the frightful severity of the law of debtor and creditor, which almost ruined the small plebeian farmers, finally led to a great revolt of the *plebs* (494 B.C.), known as the secession to the sacred hill. The plebeian farmer-soldiers, who had just returned from a campaign against the Volscians, marched in military order out of Rome, under their plebeian officers, to a mount near the confluence of the Anio with the Tiber, and threatened to found there a new city if the patricians did not grant them magistrates from their own order; the result was the institution of the famous plebeian tribunate, a sort of rival power to the patrician consulate. (See TRIBUNE, 2.) To the same period belong the ædiles (q.v.). A little later the *comitia tributa* (see COMITIA) emerged into political prominence. This was really the same body of burgesses as formed the *comitia centuriata*, but with the important difference that the number of votes was not in proportion to a property classification. The poor plebeian was on a footing of equality with the rich patrician. Hence the *comitia tributa* virtually became a plebeian assembly, and when the *plebiscita* (resolutions of the plebs carried at these *comitia*) acquired (by the Valerian laws passed after the abolition of the decemvirate) a legally binding character, the victory of the multitude in the sphere of legislation was complete. From this time the term *populus* practically, though not formally, loses its exclusive significance, and when we speak of the Roman citizens, we mean indifferently patricians and plebeians. The semihistorical traditions of this period unmistakably show that the institution of the tribunate led to something very like a civil war between the two orders. Such is the real significance of the legends of Gaius Marcius, surnamed Coriolanus (q.v.); the surprise of the Capitol by the Sabine marauder, Appius Herdonius, at the head of a motley force of political outlaws, refugees, and slaves; the migrations of numerous Roman burgesses with their families to more peaceful communities; the street fights; the assassinations of plebeian magistrates; the annihilation by the Etruscans of the Fabian *gens*, who had left Rome to escape the vengeance of their order for having passed over to the side of the plebeians (see FABIUS); and the atrocious judicial murder of Spurius Cassius, an eminent patrician, who had also incurred the deadly hatred of his order by proposing an agrarian law. Finally, 462 B.C., a measure was brought forward by the tribune C. Terentilius Harsa to appoint a commission of 10 men to draw up a code of laws for the purpose of protecting the plebeians against the arbitrary decisions of the patrician magistrates. The 10 years that followed were literally a period of organized anarchy in Rome. At length the nobles gave way, and the result was the drawing up of the famous code known as the Twelve Tables—at first 10, to which two were afterward added—the appointment of the decemviri, and the abolition of all the ordinary magistrates, both patrician and plebeian. (See DECEMVIRI; TWELVE TABLES, LAW OF THE.) The government by decemvirs, however, lasted only two years; according to tradition the occasion of its overthrow was the attempt of the principal decemvir, Appius Claudius (q.v.), to seize the daughter of Virginius, a Roman centurion; but the real cause was doubtless political, and the result was the restoration of the predecemviral state of things—the patrician consulate and the plebeian tribunate.

2. *External History.*—The external history of Rome, from the establishment of the Republic to the abolition of the decemvirate, is purely military. Long before the close of the regal period the Romans had acquired the leadership of Latium (q.v.), and in all the early wars of the Republic they were assisted by their allies and kinsmen, sometimes also by other nations, as, e.g., the Hernicans, between whom and the Romans and the Latins a league was formed by Spurius Cassius in the beginning of the fifth century B.C. The most important wars were those with the southern Etruscans, especially the Veientines (see VEII), in which, however, the Romans were unsuccessful and even suffered terrible disasters, of which the legend concerning the destruction of the Fabian gens on the Cremera (477 B.C.) may be taken as a distorted representation; the contemporaneous wars with the Volscians, in which Coriolanus (q.v.) is the most distinguished figure; and those with the Æqui, to which belongs the story of Cincinnatus (q.v.).

From the Abolition of the Decemvirate to the Defeat of the Samnites and the Subjugation of All Italy (449–265 B.C.). 1. *Internal History.*—The leading political features of this period are the equalization of the two orders and the growth of the new aristocracy of capitalists. After the abolition of the decemvirate the whole plebeian aristocracy, Senators and capitalists, combined with the masses of their order to attack the privileges of the old Roman *noblesse*. The struggle, after 100 years, was ended by the removal of all the social and political disabilities under which the plebeians had labored. First, in 445 B.C., the *lex Canuleia* enacted that marriage between a patrician and a plebeian should be legally valid. At the same time a compromise was effected with respect to the consulship. Instead of two patrician consuls it was agreed that the supreme power should be intrusted to new officers termed military tribunes with consular power, who might be chosen either from the patricians or from the plebeians. Ten years later (435 B.C.) the patricians tried to render the new office of less consequence by the transference of several of the functions hitherto exercised by consuls to two special patrician

officers named censors. (See CENSOR.) In 421 B.C. the quæstorship (see QUÆSTOR) was thrown open to the plebeians; in 368, the mastership of the horse; in 356, the dictatorship (see DICTATOR); in 351, the censorship; in 337, the prætorship (see PRÆTOR); and in 300, the pontifical and augural colleges.

The only effect of these political changes was to increase the power of the rich plebeians; the social distress continued as before. Efforts were repeatedly made by individuals to remedy the evil, but without success. Such were the attempts of the tribunes Spurius Mæcilius and Spurius Metilius (417 B.C.) to revive the agrarian law of Spurius Cassius, and of the patrician Marcus Manlius, who, though he had saved the Capitol during the Gallic siege, was hurled from the Tarpeian Rock (384 B.C.), on a trumped-up charge of aspiring to the monarchy; but at length (367 B.C.), after a struggle of 11 years, the Licinian Rogations (see AGRARIAN LAWS; LICINIAN ROGATIONS) were carried, by means of which, it was hoped, an end had been put to the disastrous dissensions of the orders. Thus, at least, we interpret the act of the dictator Camillus (q.v.), who erected a temple to the goddess Concordia (q.v.).

That these laws operated to the benefit of the plebeian farmers or middle class of the Roman state is unquestionable; but events proved that they were inadequate to remedy the evil, and after a time they ceased to be strictly enforced. Yet, owing partly to these changes and still more to the splendid and far-reaching conquests achieved in Italy during this period, the position of the plebeian farmer was decidedly raised. Not only was the treasury filled by the revenue drawn from the subjugated lands, but the numerous colonies sent forth to secure the new acquisitions consisted entirely of the poorer plebeians, who always received a portion of the land in the district where they were settled. The long struggle between the two orders was thus virtually at an end; but the date usually assigned to the termination of the strife is 286 B.C., when the *lex Hortensia* was passed, which confirmed the Publilian laws of 339 and definitely gave to the *plebiscita* passed by the *comitia* of the tribes the full power of laws binding on the whole nation. Gradually, however, the importance of the popular assemblies declined and that of the Senate rose, owing mainly to the increasing magnitude of the Roman state and to the consequent necessity of a powerful governing body. The Senate, which originally possessed no administrative power at all, now began to extend its functions, so that every matter of general importance—war, peace, alliances, the founding of colonies, the assignment of lands, building, the whole system of finance—came under its supervision and authority. See SENATE.

2. *External History.*—The military successes of Rome during this period were great. The irruption of the Gauls into sub-Apennine Italy (391 B.C.), though accompanied by frightful devastations, did not materially affect the progress of Roman conquest. The battle on the Allia (q.v.) and the capture and burning of Rome (390 B.C.) were great disasters, but the injury was temporary. The vigilance of Manlius saved the Capitol and the heroism of Camillus revived the courage and spirit of the citizens. Again and again in the fourth century B.C. the Gallic hordes repeated their incursions into central Italy, but never were they victorious. In 367 B.C. Camillus defeated them at the Alban Hills; in 360 they were routed at the Colline Gate; in 358, by the dictator C. Sulpicius Peticus; and in 350, by Lucius Furius Camillus. Meanwhile, aided by their allies, the Latins and the Hernicans, the Romans carried on the long and desperate struggle with the Æquians, Volscians, and Etruscans. Finally, after repeated defeats, the Romans triumphed, and the fall of Veii (q.v.), 396 B.C., ended Etruscan independence. Falerii, Capena, and Volsinii, all sovereign cities of Etruria, hastened to make peace, and by the middle of the fourth century B.C. all southern Etruria had submitted to Rome, was kept in check by Roman garrisons, and denationalized by the influx of Roman colonists. In the land of the Volsci, likewise, a series of Roman fortresses was erected to overawe the native inhabitants—Velitræ, on the borders of Latium (492 B.C.), Suessa Pometia (442), Circeii (393), Satricum (385), and Setia (382); besides, the whole Volscian district, known as the Pontine Marshes (q.v.), was distributed into farm allotments among the plebeian soldiery. Becoming alarmed, however, at the increasing power of Rome, the Latins and the Hernicans withdrew from the league, and a protracted struggle took place between them and their former ally. Nearly 30 years elapsed before the Romans succeeded in restoring the league of Spurius Cassius. In this war the old Latin confederacy of the thirty cities was broken up (384 B.C.), probably as being dangerous to the hegemony of Rome, and the constitutions of these cities were more and more assimilated to that of Rome itself. The terms of the treaty made by the Romans (348 B.C.) with the Carthaginians show how very dependent was the position of the Latin cities. Meanwhile, the Romans had pushed their garrisons to the Liris, the northern boundary of Campania. Here they came into contact with the Samnites (q.v.).

The Samnites had long been extending their conquests in southern Italy. Descending from the mountains between the plains of Apulia and Campania, they had firmly established themselves in Lucania, Bruttium, Capua, and elsewhere. The forays of the Samnite highlanders into the rich lowlands of Campania were dreaded above all else by their polished but degenerate kinsmen of Capua (q.v.), who had acquired the luxurious habits of the Greeks and the Etruscans. To save themselves the Campanians offered to place themselves under the supremacy of Rome, and thus Romans and Samnites were thrown into a position of direct antagonism. The Samnite wars, three in number, lasted 53 years (343–290 B.C.). The second, the "great Samnite war," lasted 22 years (326–304 B.C.). At first success was mainly on the side of the Samnites, and, after the disaster at the Caudine Forks (q.v.), Samnium seemed destined to become the ruler of Italy; but the military genius of the consul, Quintus Fabius Rullianus (see FABIUS), triumphed and rendered the heroism of Gaius Pontius, the Samnite leader, unavailing. In 304 B.C. Bovianum, the capital of Samnium, was stormed, and the highlanders were compelled to acknowledge the supremacy of Rome. The third war (298–290 B.C.) was conducted by the Samnites with all the energy of despair; but though the Etruscans and Umbrians now joined the Samnites against the Romans, their help came too late. The victory of Rullianus, and of P.

Decius Mus at Sentinum (295 B.C.), virtually ended the struggle and subjected the whole peninsula to the victor. At the close of the first Samnite war, which was quite indecisive, an insurrection had burst out among the Latins and Volscians and spread over their whole territory; but the defeat inflicted at Trifanum (340 B.C.) by the Roman consul, Titus Manlius Imperiosus Torquatus, almost instantly crushed it, and in two years the rebellion was ended. The Latin league was now dissolved; many towns lost their independence and became Roman *municipia;* new colonies were planted both on the coast and in the interior of the Latino-Volscian region; and, finally, so numerous were the farm allotments to Roman burgesses that two additional tribes had to be constituted.

The Lucanians and the Bruttians, who had aided the Romans in the Samnite wars, considering themselves cheated of their portion of the spoil, entered into negotiations with the enemies of their former associate. A coalition was formed against Rome, consisting of Etruscans, Umbrians, and Gauls in the north and of Lucanians, Bruttians, and Samnites in the south, with a tacit understanding that Tarentum would render assistance by and by. In a single year the whole north was in arms, and once more Rome was in deadly peril. A Roman army of 13,000 men was annihilated at Arretium (284 B.C.) by the Senonian Gauls, but presently Publius Cornelius Dolabella extirpated this whole nation. The overthrow of the Etrusco-Boian horde at Lake Vadimo (283 B.C.) shattered the northern confederacy and left the Romans free to deal with their adversaries in the south. The Lucanians were quickly overpowered (282 B.C.); Samnium could do nothing. A rash and unprovoked attack on a small Roman fleet now brought down on the Tarentines the vengeance of Rome. Awaking to a sense of their danger, the Tarentines invited Pyrrhus (q.v.) over from Epirus and appointed him commander of their mercenaries. He arrived in Italy (280 B.C.) with a small army of his own and a notion of founding an Hellenic empire in the West which should rival that created in the East by his kinsman, Alexander the Great. But after five years Pyrrhus was obliged to return to Epirus without accomplishing anything.

After Pyrrhus had withdrawn to Greece the Lucanians and Samnites continued the struggle, but in 269 B.C. the Samnites were definitely crushed. Tarentum had surrendered three years earlier, and now every nation in Italy acknowledged the supremacy of Rome. Distant kingdoms began to feel that a new power had risen in the world, and Ptolemy Philadelphus, sovereign of Egypt, sent an embassy to Rome (273 B.C.) and concluded a treaty with the Republic. To secure their new acquisitions the Romans established in the south military colonies at Pæstum and Cosa in Lucania (273 B.C.), at Beneventum (268 B.C.), and at Æsernia (263 B.C.), to overawe the Samnites; and in the north, as outposts against the Gauls, Ariminum (268 B.C.), Firmum in Picenum (264 B.C.), and the burgess colony of Castrum Novum. Preparations were also made to carry the great Appian Way (q.v.) as far as Brundisium, on the Adriatic, and for the colonization of that city as a rival emporium to Tarentum.

The political changes were almost as important as the military. The population of peninsular Italy was divided into three classes—(1) *Cives Romani,* those who enjoyed the full privileges of Roman citizens; (2) *Nomen Latinum,* those who possessed the same privileges as had been enjoyed by the members of the Latin league—an equality with the Roman burgesses in matters of trade and inheritance, the privilege of self-government, but no participation in the Roman franchise and consequently no power to modify the foreign policy of the Roman state; (3) *Socii,* or allies, with very varying privileges. The *Cives Romani* embraced not merely the old Roman community, the well-known tribes (of whom there were now 33), but all the old burgess colonies planted in Etruria and Campania, besides such Sabine, Volscian, and other communities as had been received into the burgess body on account of their fidelity in times of trial, together with individual Roman emigrants or their families scattered among the *municipia* or living in villages by themselves. The cities possessing the *Nomen Latinum* included most of the colonies sent out by Rome in later times, not only in Italy, but even beyond it; the members of these, if they had previously possessed the Roman franchise, voluntarily surrendered it in lieu of an allotment of land. But any Latin burgess who had held a magistracy in his native town might return to Rome, be enrolled in one of the tribes, and vote like any other citizen. The *Socii* comprised all the rest of Italy, as the Hernicans, the Lucanians, the Bruttians, the Greek cities, etc. All national or cantonal confederacies and alliances among the Italians were broken up, and no means were left unemployed by the victors to prevent their restoration. The war with Tarentum and Pyrrhus, by bringing the Romans more closely into contact with Greeks of Magna Græcia, had a very important influence in the development of the Roman mind and of Latin literature. That development was greatly advanced in the period of the First Punic War (see next paragraph), waged in Sicily, a land occupied largely by Greeks. See LATIN LITERATURE, *II, The Early or Preclassical Period.*

From the Outbreak of the Punic Wars to the Destruction of Carthage (264–146 B.C.). When Carthage (q.v.) came into collision with Rome she was the first maritime empire in the world, ruling as absolutely in the central and western Mediterranean seas as Rome in the Italian peninsula. Between the Carthaginians and the Romans there had long existed a nominal alliance; the oldest treaty was dated in the sixth century B.C. But latterly the two nations had come to regard each other with distrust. In 264 B.C. war was declared on account of a trivial incident. See CARTHAGE; MAMERTINES.

The wars with Carthage, the Punic Wars, were three in number. The first (264–241 B.C.) was waged mainly for the possession of Sicily. Its feature was the creation of a Roman navy, which finally wrested from Carthage the sovereignty of the seas. Rome had never been a merely agricultural state, but events had hindered it from engaging largely in maritime enterprise. The necessity for a navy was now felt. Not only was there difficulty in transporting troops to Sicily, but the shores of the mainland were completely exposed to Carthaginian squadrons. In 60 days from the time the trees were felled 120 ships were launched. Gaius Duilius (q.v.) gained a brilliant success (260 B.C.) over the Carthaginians off Mylæ, on the northeast coast of Sicily.

(See COLUMNA ROSTRATA; DUILIAN COLUMN.) But an invasion of Africa by Regulus (q.v.) ended in disaster, and the war, henceforth confined to Sicily, languished. Thrice the Roman navy was annihilated by storms at sea (255, 253, and 249 B.C.), and the Romans long found it impossible to make any impression on the Carthaginian strongholds of Lilybæum and Drepanum, mainly on account of the brilliant strategy with which they were held in check by Hamilcar Barca, the father of Hannibal. (See HAMILCAR, 7.) At last, however, a great sea fight took place off the Ægatian Isles (241 B.C.), in which the consul Lutatius Catulus obtained a magnificent victory. All Sicily, except the territory of Hiero of Syracuse, who had been a firm ally of the Romans, passed into the hands of the victors, who constituted it a Roman province under a prætor. A lapse of 23 years occurred before the Second Punic War began, but during that interval neither Romans nor Carthaginians had been idle. The former had bullied their exhausted rival into surrendering Sardinia and Corsica, which, like Sicily, were transformed into a Roman province. In addition, in a series of Gallic wars in Cisalpine Gaul (231–222 B.C.), they had humiliated the barbarian Boii, Insubres, etc., and had extended Italy to the Alps. On the Adriatic also the Romans made their power felt by the suppression of Illyrian piracy (219 B.C.). Meanwhile the descent of Hamilcar on the Spanish coast was followed by the establishment of a new Carthaginian empire in Spain, and thus, almost before the Romans were aware of it, their rival was able to renew the struggle in a more daring fashion than before.

In the Second Punic—or, as the Romans preferred to call it, the Hannibalic—war, the grand events were the crossing of the Alps by Hannibal (q.v.), the disasters of the Romans at Lake Trasimenus (217 B.C.) and Cannæ (216 B.C.), and the overthrow of Hannibal at Zama (202 B.C.) by Scipio, the Elder Africanus, which again compelled the Carthaginians to sue for peace. The Spanish possessions of Carthage now passed to the Romans (who formed out of them the provinces of Hispania Citerior and Hispania Ulterior); so did her protectorate over the Numidian sheiks. She was forced to surrender her navy (excepting 10 triremes) and all her elephants and solemnly to swear never to make war either in Africa or abroad except with the consent of Rome. The supremacy of Rome was now as unconditional in the western Mediterranean as in Italy. Her relations, indeed, to the conquered Italian nationalities became much harsher than they had formerly been, for, after the first victories of Hannibal, these had risen against her. The Picentes, Bruttii, Apulians, and Samnites were deprived either of the whole or of the greater part of their lands; some communities were turned into collections of serfs; the Greek cities in lower Italy, most of which had also sided with Hannibal, became the burgess colonies. But the loss of life and of vital prosperity had been frightful. Still the perilous work of conquest went on. During 201–196 B.C. the Celts in the valley of the Po, who had recommenced hostilities when Rome was freed from her embarrassments, were subjugated; their territory was Latinized, but they themselves were declared incapable of acquiring Roman citizenship; and so rapidly did their nationality dissolve that when Polybius (q.v.), only 30 years later, visited the country, nearly all Celtic characteristics had disappeared. The Boii were finally subjugated about 193 B.C., the Ligurians were subdued 180–177 B.C., and the interior of Corsica and Sardinia about the same time. The wars in Spain were troublesome and longer, but in the end the legions always prevailed. Still the Romans felt it necessary to hold Spain by military occupation, and hence arose the first Roman standing armies. Forty thousand troops were maintained in Spain. The most distinguished successes there were those achieved by Scipio himself, by Quintus Minucius (197–196 B.C.), by Marcus Cato (195 B.C.), by Lucius Æmilius Paulus (189 B.C.), by Gaius Calpurnius (185 B.C.), by Quintus Fulvius Flaccus (181 B.C.), and by Tiberius Gracchus (179–178 B.C.).

Macedonian and Greek Wars. The causes that led to the interference of Rome in the politics of the East are too complicated to be given here, but the three Macedonian wars were due immediately to the alliance formed by Philip V of Macedon with Hannibal after the battle of Cannæ. The first (214–205 B.C.) was barren of results, mainly because the energies of Rome were directed to Spain and lower Italy; but the second (200–197 B.C.) taught Philip that another must rule in Greece. The battle of Cynoscephalæ (q.v.) was followed by a treaty which compelled him to withdraw his garrisons from the Greek cities, to surrender his fleet, and to pay 1000 talents towards the expenses of the war. During the remaining 18 years of his life Philip adhered to his Roman alliance. But the Ætolians, who had formed an alliance with Rome against Philip, quarreled with their allies and persuaded Antiochus the Great (q.v.) of Syria to come to Thessaly (192 B.C.). He was overthrown by Scipio (Asiaticus) at Magnesia in Asia Minor (190 B.C.) and obliged to surrender his possessions in Europe and Asia Minor, his elephants and ships, and to pay a war indemnity. Next year the Ætolians were crushed, and later the quarrels between the Achæans and the Spartans led to a Roman protectorate over Greece. See ACHÆA; ÆTOLIA; ÆTOLIAN LEAGUE.

Philip V of Macedon was succeeded by Perseus (q.v.), and in 172 B.C. the third Macedonian war began. It ended with the destruction of the Macedonian army at Pydna (168 B.C.) by Lucius Æmilius Paulus (q.v.); the Macedonian Empire was broken up into four oligarchic republics. Rome stopped Antiochus Epiphanes in his career of Egyptian conquest, ordered him to abandon his acquisitions, and accepted the protectorate of Egypt in 168 B.C. We may here anticipate the course of history and mention the last Greek and Punic wars. Both of these came to an end in the same year (146 B.C.). The former was caused by an outburst of pseudo-patriotism in the Achæan League, and was virtually closed by the destruction of Corinth (q.v.) by the consul Mummius. After Hannibal's death his party in Carthage seems to have recovered the ascendancy, and, as the commercial prosperity of the city began to revive, a bolder front was shown in resisting the encroachments of Masinissa, the Numidian ruler, whom the Roman Senate protected in his aggressions. In 146 B.C., after a siege of three years, Carthage was stormed by Scipio Africanus Minor and the Carthaginian Empire vanished forever.

Position of Rome at the Close of the Punic Wars and Sketch of its Subsequent Social

Condition to the Termination of the Republic (146–27 B.C.). With the enormous extension of power in foreign lands the national character underwent a complete alteration. The simplicity and integrity of life, the gravity of deportment, and the fidelity with which common civic and household duties were discharged, which in early times distinguished the Roman burgess, had now all but disappeared. The class of peasant proprietors who had laid the foundations of Roman greatness was either extinct or no longer what it had been. The long and distant wars made it more difficult for the soldier to be a good citizen or farmer. Indolence, inaptitude, and spendthrift habits aided the designs of the capitalists, and in most cases the paternal acres gradually slipped into the possession of the great landlords, who found it profitable to turn them into pasture or cultivate them by gangs of slaves. The rise of the slave system, an inevitable result of foreign conquest, was, indeed, the most horrible curse that fell on ancient Rome. If the Italian farmer strove to retain his farm, he was exposed to the competition of the capitalists, who shipped immense quantities of grain from Egypt and other granaries, where slave labor rendered production cheap, and of course he failed in the unequal struggle. Not less pernicious was the change in the character of the rich. As the old Roman patricians lost their exclusive privileges the plebeians gradually acquired equality with them, and the germs of a new social aristocracy originated, based on wealth rather than pedigree and comprising plebeians and patricians. During the fourth and third centuries B.C. the political power of this order immensely increased. In fact the whole government of the state passed into their hands. They became an oligarchy and displayed extraordinary ability in the conduct of foreign affairs. But selfishness, nepotism, and arrogance gradually became rampant. Far worse even than this selfishness and nepotism were their increasing luxury and immorality. When Rome had conquered Greece and Syria and Asia Minor, the days of her true greatness were ended. The wealth that poured into the state coffers, the treasures which victorious generals acquired, enabled them to gratify to the full the morbid appetites for pleasure engendered by exposure to the voluptuousness of the East. Such results were, it is true, not brought about in a day nor without a resolute protest on the part of individual Romans. So long as Rome chose to subdue foreign nations and to hold them by the demoralizing tenure of conquest—i.e., as mere provinces, whose inhabitants, held in check by a fierce soldiery, neither possessed political privileges nor dared cherish the hope of them—it was morally impossible for the citizens, either at home or abroad, to resume the frugal habits of their forefathers. After the time of Cato the Censor things grew worse, nor from this period was a single radical reform ever permanently effected. The momentary success of Tiberius Gracchus and of his far abler brother, Gaius, in their attempts to prevent the social ruin of the state by redistributing the domain lands, breaking down the powers of the Senate, reorganizing the administration, and partially restoring the legislative authority of the popular assemblies, hardly survived their death. (See AGRARIAN LAWS; GRACCHUS, 3, 4.) The reaction proved that the Senate could learn nothing from adversity and that the rabble of the city was incapable of elevation of political sentiment. Henceforth the malversation of public money by prætors and quæstors became chronic and the debauchery of the mob of the capital by the largesses of politicians and the flattery of demagogues complete. The old Roman faith, so deep and stern, disappeared. (See ROMAN RELIGION.) The priests became hypocrites, the nobles philosophers (i.e., unbelievers), their wives practicers of Oriental abominations under the name of mysteries; while the poor looked on with superstitious wonder at the hollow ceremonies of religion.

From the Destruction of Carthage to the Termination of the Republic (146–27 B.C.). We have alluded to the wars in Spain during the first half of the second century B.C. The conciliatory policy pursued towards the natives by Tiberius Sempronius Gracchus, father of the ill-fated tribunes, brought about a peace, 179 B.C., that lasted 25 years; but in 153 B.C. a rising of the Celtiberians took place, followed by another on the part of the Lusitanians. The struggle ended in the final overthrow of the undisciplined and uncivilized combatant (133 B.C.). See CELTIBERI; LUSITANIA; NUMANTIA.

Towards the conclusion of the Numantine War occurred the first of those social outbreaks known as servile or slave wars. What especially aggravated the wretchedness of the slaves was that most of them had been originally freemen, not inferior in knowledge or accomplishments to their masters. The first slave insurrection broke out in Sicily (134 B.C.), where the system was at its worst. Its leader was one Eunus, a Syrian, who, mimicking his native monarch, took the title of King Antiochus. The fury of the revolt for a time rendered opposition impossible. The slaves routed one Roman army after another. In 132 B.C. the Consul Publius Rupilius restored order in the island. In the East Attalus III Philometer, dying 133 B.C., bequeathed his client kingdom of Pergamon (q.v.) to its protector, Rome; and after a fierce struggle with a pretender called Aristonicus, the Romans obtained possession of the bequest and formed it into the Province of Asia (129 B.C.).

We may here enumerate the different provinces into which the Roman Senate divided its foreign conquests in the order of their organization: (1) Sicily, 241 B.C.; (2) Sardinia and Corsica, 238 B.C.; (3) Hispania Citerior and (4) Hispania Ulterior, 205 B.C.; (5) Gallia Cisalpina, 191 B.C.; (6) Macedonia, 146 B.C.; (7) Illyricum, c.146 B.C.; (8) Achæa (or southern Greece), c.146 B.C.; (9) Africa (i.e., the Carthaginian territory), 146 B.C.; (10) Asia (Kingdom of Pergamum), 129 B.C. A few years later, 118 B.C., an eleventh was added by the conquest of the southern part of Transalpine Gaul, and was commonly called, to distinguish it from the rest of the country, the Province; hence the modern Provence.

In Africa the overthrow of Jugurtha (q.v.), 106 B.C., by the consul Marius (q.v.), increased the military renown of the Republic. Meanwhile, north of the Alps there had long been roaming in the region of the upper Danube an unsettled people called the Cimbri (q.v.). They first came into collision with the Romans in Noricum (113 B.C.); later they turned westward and poured through the Helvetian valleys into Gaul, where they overwhelmed the native tribes and the Roman armies. At Arausio (Orange), on the Rhone, 105 B.C., a Roman army of 80,000 was

annihilated; but, instead of invading Italy, the barbarians rushed through the passes of the Pyrenees, wasted months in contests with native tribes of Spain, and gave the Romans time to recover from the effects of their defeat at Arausio. Marius, who had just returned from his Numidian victories, was reëlected consul, and at Aquæ Sextiæ (Aix, in Provence) he overwhelmed the Teutones, a northern horde, who had accompanied the Cimbri in their irruption into Spain (102 B.C.). Next year, on the Raudian Fields, in Transpadane Gaul, the same doom befell the Cimbri themselves. In the same year a second insurrection of the slaves in Sicily was suppressed by the consul Marcus Aquillius.

In the succeeding years the internal history of Rome is a scene of confusion. Marius, an admirable soldier, but otherwise unfit to play the part of a statesman, was the idol of the poor citizens, who urged him to save the state from the misgovernment of the rich. His attempts failed. Not less fruitless was the patriotic effort of Livius Drusus to effect a compromise between the privileges of the rich and the claims of the poor. The oligarchic party among the former, i.e., the Senate, was enraged by his proposition to double their numbers by the introduction of 300 equites; the latter were equally incensed by his offer to the Latins and allied Italians of the Roman franchise. Drusus fell (91 B.C.) by the hand of an assassin. Hardly a year elapsed before the subject Italians, the Marsians, Peligni ans, Marrucinians, Vestinians, Picentines, Samnites, Apulians, and Lucanians, were up in furious revolt against Rome (Marsic or Social War, q.v.); and, though the rebellion was crushed in less than two years by the generalship of Marius, Sulla, and Pompeius Strabo (father of the great Pompey), aided by the diplomacy of Rome, the insurgents virtually triumphed; for the promise which Drusus had held out to them of the Roman franchise was made good by the Lex Plautia Papiria (89 B.C.). The jealousy that had long existed on the part of Marius towards his younger rival, Sulla (q.v.), increased when the latter was elected consul (88 B.C.) and received the command of the Mithridatic War (see MITHRIDATES), an honor which Marius coveted for himself. Then followed the years of civil war (88–82 B.C.), the partisans of Marius continuing to fight after their leader's death (86 B.C.). Proscriptions were the order of the day. Sulla, the leader of the aristocracy, which was nominally the party of order, triumphed, but the energy displayed by the revolutionists convinced him that the Roman franchise could never again be safely withdrawn from the Italians, and Roman citizens, therefore, they remained till the dissolution of the Empire; but, on the other hand, Sulla's whole legislation was aimed at the destruction of the political party of the burgesses and the restoration to the senatorial aristocracy and priesthood of the authority they had possessed in the times of the Punic wars. That his design was to build up a vigorous executive cannot be doubted, but the rottenness of Roman society was beyond cure by any human policy. The complicated history of this period will be found given with considerable fullness of detail in the biographies of its leading personages, ANTONIUS, AUGUSTUS, BRUTUS, CÆSAR, CASSIUS, CATILINE, CATO, CICERO, CLODIUS PULCHER, CRASSUS, MITHRIDATES, POMPEY, SERTORIUS. Here we can only enumerate results.

Abroad the Roman army continued to prove irresistible. In 88 B.C. there broke out in the Far East the first of the three Mithridatic wars. Begun by Sulla, they were brought to a successful close by Pompey (65 B.C.), although the general that had broken the power of Mithridates was Lucullus. The result was the annexation of the Kingdom of Pontus as a province of the Roman Republic. In 64 B.C. Pompey marched southward, deposed Antiochus Asiaticus, King of Syria, transforming his Kingdom also into a Roman province, and in the following year he made Palestine a dependency of Rome. In 63 there was hatched at Rome the conspiracy of Catiline (q.v.). One thing now becomes particularly noticeable, the paralysis of the Senate. In spite of all that Sulla did to make it once more the governing body, the power passed out of its hands. Torn by jealousies, it could only squabble or attempt to frustrate the purposes of men whom it considered formidable. Henceforth the importance of Roman history attaches to individuals and the Senate sinks deeper into insignificance, until it becomes merely the council of the emperors. The famous coalition of Crassus, Pompey, and Cæsar (known as the first triumvirate) in 60 B.C. showed how weak the government was and how powerful individuals had become; the same fact is even more clearly shown by the lawless tribunates of Clodius and Milo (58–57 B.C.). The campaigns of Cæsar in Gaul (58–51 B.C.), by which the whole of that country was reduced to subjection; his rupture with Pompey; his defiance of the Senate; the civil wars; his victory, dictatorship, and assassination; the restoration of the senatorial oligarchy; the second triumvirate, composed of Antonius, Lepidus, and Octavianus (Augustus); the overthrow of the oligarchy at Philippi; the struggle between Antonius and Octavianus; the triumph of the latter through his victory at Actium over the fleets of Antonius and Cleopatra (31 B.C.), and his investment with absolute power for life (29 B.C.), which put an end at least to the civil dissensions that had raged so long, are described in the biographical articles already referred to.

Roman Empire. When Augustus had gathered into his own hands all the civil and military powers of the state, its political life was at an end. Rome had become an empire, in which some of the forms of the Republic, including the Senate and the consulship, were preserved. When Augustus died (14 A.D.) the Roman Empire was separated in the north from Germany by the Rhine, but it also included both Holland and Friesland; from the vicinity of the Lake of Constance the boundary followed the Danube to Lower Mœsia, though the Imperial authority was far from being firmly established there. In the extreme east the boundary line was, in general, the Euphrates; in the south, Egypt (annexed on the death of Cleopatra in 30 B.C.), Libya, and, in fact, the whole of northern Africa as far inland as Fezzan and the Sahara acknowledged Roman authority. The Roman franchise was extended to transmarine communities, and in the western provinces especially it became quite common. To keep under subjection this enormous territory, containing so many different races, an army of 47 legions and as many cohorts was maintained, levied mainly among the newly admitted burgesses of the western provinces. The reigns of Tiberius (14–37 A.D.), Caligula (37–41 A.D.), Claudius (41–54 A.D.), Nero (54–68 A.D.), Galba (68 A.D.), Otho (69 A.D.), and Vitellius (69 A.D.) present little of any moment in a

THE
ROMAN EMPIRE
AT ITS GREATEST EXTENT
ABOUT 117 A. D.
SCALE OF MILES.
0 100 200 300 400 500 600 700 800
ANCIENT ROME.
Longitude East from Greenwich
OCEANUS ATLANTICUS
Oceanus Germanicus
HIBERNIA
BRITANNIA
GERMANIA
GALLIA
HISPANIA
MARE
MAURETANIA
NUMIDIA
MARE INTERNUM
SARMATIA
DACIA
MOESIA
THRACIA
MACEDONIA
ASIA
Pontus Euxinus (Black Sea)
Mare Caspium (Mare Hyrcanium)
ARMENIA
PONTUS
BITHYNIA
GALATIA
CAPPADOCIA
CILICIA
SYRIA
MESOPOTAMIA
ASSYRIA
R. PARTHORUM
ARABIA
LIBYA
AEGYPTUS
Sinus Arabicus
Mare Tuscum
Mare Adriaticum
Mare Aegaeum
Mare Ionium et Siculum
Campus Martius
Capitolium
Palatinus
Caelius
Aventinus
Viminalis
Esquilinus
Quirinalis
THEATRE AND PORTICO OF POMP.
CIRCUS FLAMINIUS
WALL OF AURELIAN
M.-N ENG.

general survey of the external history of the Empire. The most notable incident of this period is probably the concentration of the prætorian guards (see PRÆTORIAN GUARD) in the vicinity of Rome during the reign of Tiberius. Under Claudius the conquest of Britain, to which Cæsar had made two expeditions, was begun. (See BRITANNIA.) In Nero's time Armenia was wrested from the Parthians, and restored to them only on condition of their holding it as a fief of the Empire; the Roman authority in Britain was extended as far north as the Trent; and a great rebellion in Gaul against Nero, headed by Julius Vindex, was crushed by T. Virginius Rufus, commander of the Germanic legions. During the profound peace that the Empire had enjoyed everywhere except on its frontiers, its material prosperity had greatly increased. The population was more than doubled; the towns became populous and were embellished with splendid monuments of architecture and sculpture; the wastes were peopled wherever, at least, the publicani (q.v.) or farmers general had not got the land into their hands; Roman literature reached its culmination; the refinements of civilization were carried to the Roman frontiers in the far north and to the borders of the African desert in the south; but the immorality of the rich, especially among the women, became even worse than before and corruption reigned supreme.

With the accession of Vespasian (69–79 A.D.) a better era commenced, which, if we except the reign of Domitian, continued uninterrupted for 100 years, comprising the reigns, besides those mentioned, of Titus (79–81 A.D.), Nerva (96–98 A.D.), Trajan (98–117 A.D.), Hadrian (117–138 A.D.), Antonius Pius (138–161 A.D.), and Marcus Aurelius Antonius (161–180 A.D.). These were all men of fine and honorable character. Under them the provinces were better governed, the finances better administered, and public morals wonderfully improved. After the time of Vespasian the worst days of Rome (in a moral point of view) were over. How far the change was due to the Christian religion it is impossible to tell; but Christianity did send a reinvigorating breath of new life through the old body of the state. The chief military events from the days of Vespasian to those of Marcus Aurelius are the final conquest of Britain by Agricola (q.v.), the conquest of the Dacian monarchy by Trajan, the victorious invasion of Parthia and of northern Arabia, the conquest of the valley of the Nile as far south as upper Nubia by Trajan, and the chastisement of the Marcomanni (q.v.), Quadi, Chatti, etc., by Marcus Aurelius. Hadrian's long rule of 21 years was peaceful; it is memorable too as the most splendid era of Roman architecture. The reigns of Commodus (q.v.), Pertinax (q.v.), and Didius Julianus (q.v.) were insignificant. The reign of Septimius Severus (193–211 A.D.) marks the first change in the attitude of the emperors towards Christianity. The new religion was making itself felt in the state, and Severus, who was a Carthaginian, while his wife was a Syrian, may have felt a special interest in a faith that like themselves was of Semitic origin. At all events it was taken under the Imperial protection and began to make rapid way. Caracalla (q.v.) and Elagabalus (q.v.) are perhaps the worst of all the emperors in point of criminality; but the brutality of the one and the debauchery of the other were personal affairs, regarded with horror by the citizens. The reign of Alexander Severus (222–235 A.D.) was distinguished by wisdom and justice. After the death of Severus followed a period of confusion. The names of Maximinus (q.v.), Maximus (q.v.), Balbinus (q.v.), Gordianus (q.v.), and Philip recall nothing but usurpation and assassination. Then came the beginning of the end. The whole of Europe beyond the Roman frontier began to ferment. The Franks showed themselves on the lower Rhine, the Swabians on the Main; while the Goths (q.v.) burst through Dacia, overthrew the Emperor Decius (q.v.), and ravaged the whole northern coast of Asia Minor. During the reigns of Valerianus (q.v.), Gallienus, and the so-called thirty tyrants the Empire is a wild chaos, Franks, Alemanni, Goths, and Persians rushing in from their respective quarters. The Goths swept over the whole of Achæa, pillaging and burning the most famous cities, Athens, Corinth, Argos, etc.; while the hosts of Sapor committed great havoc in Syria and Asia Minor and but for the courage and skill of Odenathus, husband of Zenobia (q.v.), who had built up an independent kingdom in the Syrian desert, with Palmyra (q.v.) for its capital, might have possessed themselves of the regions which they merely devastated. With Claudius Gothicus (268–270 A.D.), the fortunes of the Empire brightened. By him and his successors, Aurelian (q.v.), Probus (q.v.), and Carus, the barbarians of the north and northwest, as well as the Persians in the east, were severely chastised. Indeed, when Diocletian (q.v.) obtained the purple (284 A.D.) it seemed as if the worst was over; but his division of the Empire into East and West, with separate Augusti and assistant Cæsars, though it sprang from a perception of the impossibility of one man's administering the affairs of so vast a state, led to those civil wars in which figure the names of Maximian (q.v.), Constantius, Galerius (q.v.), Maxentius (q.v.), Maximinus Daza (q.v.), Licinius (q.v.), and Constantine, and which were brought to a close only by the genius of Constantine (q.v.). Under Constantine (sole Emperor 323–337 A.D.) occurred the establishment of Christianity as the religion of the state. Constantine, again, transferred the seat of government from Rome to Byzantium (q.v.) on the Bosporus, where he founded a new city, Constantinople. But no sooner was this statesman dead than the discords that he had kept under by the vigor of his rule broke loose; the Empire underwent a triple division among his sons; and, though Constantius, the youngest, soon became sole ruler, he failed to display the genius of his father and in his campaigns against the Persians reaped nothing but disaster. But the political fortunes of the Empire now possess only a secondary interest; it is the struggle of the Christian sects and the rise of the Church that attract the attention of the historian. There, at least, we behold the signs of new life, a zeal, enthusiasm, and inward strength of soul that no barbarism could destroy. Christianity came too late to save the ancient civilization, but it enabled the Roman world to endure three centuries of barbarism and afterward to recover a portion of the inheritance of culture that it seemed once to have lost forever. The attempt of the Emperor Julian (361–363 A.D.) to revive paganism was an anachronism. After the death of Julian the signs of the

approaching dissolution of the Empire became unmistakable. Yet the great state again put forth a momentary strength that amazed her foes. Valentinian (q.v.), Gratian (q.v.), and Theodosius the Great (q.v.) were rulers worthy of better times, but they fought against destiny. Already swarms of Huns (q.v.) had driven the Goths out of Dacia, where they had settled, and forced the Visigoths to cross the Danube into the Roman territory, where the oppression of the Imperial officers goaded the refugees into insurrection; in their fury, they devastated the whole East from the Adriatic to the Euxine. Theodosius, indeed, subdued them, but he could not prevent them from drawing nearer to the heart of the Empire, and already they are found scattered over all Mœsia and northern Illyricum. For a brief moment (394–395 A.D.) the Roman world was reunited under the rule of Theodosius the Great. On his death occurred the final division into the Western Empire and the Eastern or Byzantine (Greek) Empire. Arcadius and Honorius, the sons of Theodosius, succeeded to the sovereignty of the East and the West respectively. Hardly was Theodosius dead when the Visigoths rose again, under their chief, Alaric (q.v.), against Honorius (q.v.), Emperor of the West. Rome was saved only by the splendid bravery and skill of Stilicho (q.v.), the Imperial general; but after his assassination the barbarians returned, sacked the city (410 A.D.), and ravaged the peninsula. Four years earlier hordes of Suevi, Burgundians, Vandals, and Alani burst into Gaul (where the native Celts had long been largely Romanized in language and habits), overran the whole, and then penetrated into Spain. It is impossible, within our limits, to explain the imbroglio that followed in the West—the struggles between Visigoths and Vandals in Spain, between Romans and both, between usurpers of the purple and loyal generals in Gaul, the fatal rivalries of Boniface, Governor of Africa, and Aëtius, Governor of Gaul, which led to the invasion of Africa by the Vandals under Genseric (q.v.) and its devastation from the Strait of Gibraltar to Carthage (429 A.D.). Meanwhile in the East the Huns had reduced vast regions to an utter desert. In 451 they swept westward as far as the interior of Gaul. Here they were checked by the forces of Aëtius and the Visigoths on the Catalaunian Plain. In the following year Rome was saved from their assault only through the personal interposition of its Bishop, Leo the Great. Aëtius was assassinated by his sovereign, Valentinian III, whose outrages led to his own murder; while his widow, Eudoxia, to be revenged on his murderer and successor, Petronius Maximus, invited Genseric over from Africa and exposed Rome to the horrors of pillage at the hands of a Vandal horde. Ricimer, of the nation of the Suevi, next figures as a sort of governor of the city and what relics of empire it still possessed, for Gaul, Britain, Spain, western Africa, and the islands in the Mediterranean had all been wrested from it. While Majorian, the last able Emperor, lived, Ricimer's position was a subordinate one, but thenceforth the Western Emperor was merely an emperor in name, while the real sovereignty was exercised by this Suevic *maire du palais*, who was succeeded in his functions by the Burgundian King Eunobald, and the latter again by Orestes, in whose time the final catastrophe happened, when Odoacer (q.v.), placing himself at the head of the barbarian mercenaries of the Empire, deposed the last occupant of the throne of the Cæsars (476 A.D.), who, by a curious coincidence, bore the same name as the mythical founder of the city—Romulus. (See EUROPE, *History*, Roman Civilization, Europe under the Roman Empire.) The Empire of the East (see BYZANTINE EMPIRE) outlived the Roman Empire by nearly 1000 years. See *History* under ITALY; PAPAL STATES. Roman archæology has been treated under the head of ARCHÆOLOGY. For the art and religion of ancient Rome, see ROMAN ART; ROMAN RELIGION.

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ROME. A city and the county seat of Floyd Co., Ga., 72 miles northwest of Atlanta, at the junction of the Etowah and the Oostanaula rivers, which here unite to form the Coosa, and on the Southern, the Central of Georgia, the Nashville, Chattanooga, and St. Louis, the Western and Atlantic, and the Rome and Northern railroads (Map: Georgia, A 1). It is the seat of Shorter College for Women (Baptist), opened in 1877, and contains three preparatory schools. Among other features of the city are eight iron bridges, Mobley Park, the post-office building, the Carnegie library, a splendid municipal building, several monuments, and the county courthouse. The river valleys yield large crops of cotton, grain, and hay, and the higher land varieties of fruit. In addition to its commercial importance Rome has acquired prominence as an industrial city. It has cotton, planing, and hosiery mills, a tannery, stove works, machine shops, an iron furnace, a large nursery, and manufactories of cottonseed oil, plows, scales, furniture, fertilizers, wrapping twine, brick, lime, sewer pipe, tents, awnings, crates and boxes, trousers, and mattresses. Rome was chartered as a city in 1847 and adopted the commission form of government in 1915. In 1863 the Confederate General Forrest with 600 men here captured a Federal force of 1800 under General Streight, and in 1864 the city was occupied for some time by General Sherman, on his campaign in Georgia. Pop., 1900, 7291; 1910, 12,099; 1914 (U. S. est.), 14,146; 1920, 13,252.

ROME. A city and one of the county seats of Oneida Co., N. Y., 15 miles northwest of Utica, at the junction of the Barge, Erie, and Black River canals, on the Mohawk River and on the New York Central and the New York, Ontario, and Western railroads (Map: New York, E 4). An attractive residential city, Rome is regularly laid out with wide, shaded streets. Features of interest are Lake Delta and the Great Delta Dam, Fort Stanwix Park, the Jervis library, Young Men's Christian Association, State Custodial Asylum, Deaf Mute Institute, Oneida County Home and Hospital, Home for the Aged, Academy of the Holy Names, Rome Free Academy, and St. Aloysius Academy. The city is especially noted for its output of cheese and butter. The principal manufactures are electrical supplies, locomotives, brass and copper products, wire, canned goods, bedsteads,

automobile, radiators, knit goods, beer, and cans. On the site of Rome Fort Stanwix was built in 1758. Near here on Aug. 6, 1777, the battle of Oriskany (q.v.) was fought. Here the stars and stripes were first unfurled in battle. Soon after the Revolution Rome was settled and became a town in 1796. The village was incorporated in 1819 and in 1870 was chartered as a city. Pop., 1900, 15,343; 1910, 20,497; 1915 (State census), 23,868; 1920, 26,341.

ROME. The name of the second novel (1895) of Emile Zola's trilogy—*Lourdes*, *Rome*, and *Paris*.

ROME, American College in. An institution in Rome, Italy, founded in 1859, largely through the efforts of Archbishop Hughes of New York and Archbishop Kenrick of Baltimore, for the education of American clergy. Its first president was Rev. William George McCloskey, afterward Bishop of Louisville. The sums necessary for its foundation were largely contributed from the United States. The title of the property is in the Sacred Congregation of the Propaganda.

ROME, Prix de. See Prix de Rome.

ROME, University of. An institution founded in 1303 by Pope Boniface VIII. It perished during the Great Schism and was refounded in 1431 by Eugenius IV. It was a Papal institution until 1870, when it came under control of the Italian government. This university is the old Studium Urbis, now the Royal University. The Royal University had, in 1912–13, 3919 students and included engineering, pharmaceutical, agricultural, and diplomatic-colonial schools, besides the faculties of philosophy, science, medicine, and law. Its library, the Biblioteca Alessandrina, contains about 136,000 volumes, besides 102,500 pamphlets and several hundred manuscripts. The university comprises one college, the Collegio Capranica, founded by Cardinal Capranica in 1458.

RO'MEO AND JU'LIET. A tragedy by Shakespeare, first printed surreptitiously by Danter in 1597, probably from an old stage copy. A corrected edition appeared in 1599. The earliest form of the play was written possibly in 1591, while the development into the present setting can be detected by comparing the two editions. The source of the story is a tale in the collection of Massuccio di Salerno, printed in 1476, though similar incidents are found in a romance by Xenophon Eplusius, a mediæval Greek. It was told again by Luigi da Porto in his *Historia di due nobili amanti* in 1530, derived from oral sources and the first to give the names of the lovers. The story was told in verse by Gherardo Boldiero in 1553, and again by Bandello as *La sfortunata morte di due infelicissimi amanti*, in his *Novelle* in 1554. This was translated into French by Pierre Boisteau in his *Histoires tragiques*, 1559, and thence into English by Paynter in the *Palace of Pleasure*, 1567, as *Rhomeo and Julietta*. The direct source of the tragedy, an English poem, "The Tragicall Historye of Romeus and Juliet," was written by Arthur Brooke in 1562, who mentioned an old play on the subject, now lost. The tale has no historical foundation, though told in Girolano della Corte's *Storia di Verona* in 1594 as an event of 1303. It has been a favorite subject for musical composers. Zingarelli produced the opera *Giulietta e Romeo* in 1796; Bellini, *I Capuletti ed i Montecchi* in 1830; and Gounod, *Roméo et Juliette* in 1867; while Berlioz wrote the dramatic symphony *Roméo et Juliette* in 1839. See Capulets and Montagues.

ROMÉO ET JULIETTE, rō'mā'ō' ā zhụ'lyĕt'. An opera by Gounod (q.v.), first produced in Paris, April 27, 1867; in the United States, Feb. 24, 1870 (New Orleans).

RÖMER, rĕ'mĕr, Olaus, or Ole (Christensen) (1644–1710). A Danish astronomer, born at Aarhus, Jutland. He was educated at Copenhagen University and afterward accompanied Picard to France and was appointed tutor to the Dauphin by Louis XIV. He became eminent in astronomy and mathematics and was made a member of the Academy of Sciences in 1672. He was an associate of Picard and G. D. Cassini (qq.v.) in many investigations and discoveries. In 1681 he returned to Denmark as professor of astronomy at Copenhagen, and later held several public positions, becoming chief of police and burgomaster in 1705. Römer's principal claim to fame rests on his discovery that light does not move through space instantaneously, but requires an appreciable interval of time for its transmission. (See Light, *Velocity*.) His astronomical observations were published by his pupil and successor, Peter Horrebow, in 1735 under the title *Basis Astronomidæ seu Astronomidæ Pars Mechanica*. An edition of his *Adversaria* appeared in 1910.

ROMERO, rō-mā'rō. See Pilot Fish.

ROMERO, rō-mā'rō, Matias (1837–98). A Mexican diplomat, born and educated in Oaxaca. He studied law in the city of Mexico and was admitted to the bar in 1857. From 1859 to 1863 he was connected with the Mexican Legation at Washington, and, after serving under Díaz against the French, returned to Washington as Plenipotentiary. Returning to Mexico in 1868, he was for six years Secretary of Treasury (1868–72, 1877–78) and for two years Postmaster-General (1879–80). From 1882 until his death, except for an interval in 1892, he was again Minister to the United States. He published many official reports, *Correspondence of the Mexican Legation at Washington during the French Intervention* (1870–85), *Geographical and Statistical Notes on Mexico* (1898), and *Mexico and the United States* (1898).

ROMEYN, rō'mīn, John Brodhead (1777–1825). An American clergyman. He was born at Marbletown, Ulster Co., N. Y., received his early education at an academy, since developed into Union College, and graduated at Columbia in 1795. He was pastor of the Dutch Reformed Church at Rhinebeck, N. Y., and of Presbyterian churches at Schenectady and Albany. In 1808 he was called to the Cedar Street Church, New York, with which he remained until his death. He helped to establish Princeton Theological Seminary, and at 33 was moderator of the General Assembly of the Presbyterian church.

ROMFORD, rŭm'fĕrd. A market town in Essex, England, on the Bourne, 12 miles east-northeast of London (Map: England, G 5). It is noted for its ale breweries and market gardens, which are extensively cultivated; it has also ironworks and pyrotechnic factories, and grain and cattle markets are periodically held. Romford dates from the Saxon period. Pop., 1901, 13,650; 1911, 16,970.

ROM'ILLY, Sir Samuel (1757–1818). An English jurist and law reformer, born at Westminster. He was called to the bar in 1783 and in 1805 was made Chancellor of the County

Palatine of Durham, which position he held until 1815. He was returned to Parliament several times and was active in securing reforms, especially in the mitigation of the harsh criminal laws. He committed suicide in 1818. Besides numerous pamphlets he published: *Thoughts on Executive Justice* (London, 1786); *Observations on the Criminal Law of England* (ib., 1813); *Objections to the Project of Creating a Vice-Chancellor of England* (ib., 1813).—His son, JOHN, first BARON ROMILLY (1802–74), was successively Solicitor-General, Attorney-General, and Master of the Rolls. He performed a great public service in the supervision of a compilation and collection of the Public Records of England.

RO'MITE. See EXPLOSIVES.

ROMNEY, rŭm'nĭ, GEORGE (1734–1802). An English portrait painter, one of the most eminent of the Old English masters. He was born Dec. 26, 1734, at Dalton in Lancashire, the son of a farmer. Except for a brief training with a strolling artist named Steele, he was practically self-taught, having mastered the technique of his art in an incredibly short time. He married in 1756, settled in Kendal, Westmoreland, and there he practiced portrait painting until 1762. In this year he removed to London, leaving his wife and two children, provided for, behind. His first exhibited picture, "The Death of Wolfe" (1763), won a prize at the Society of British Artists. In 1764 he visited Paris, and after his return he soon shared the patronage of the aristocracy with Reynolds and Gainsborough. From 1773 to 1775 Romney studied in Rome and in Paris, and was especially influenced by Titian's color and by Greuze. He continued to reside in London until 1799, when illness caused his return to Westmoreland.

Romney is one of the most important masters of the English school. Although uneven in technique, at his best he excels in mastery of line any of his contemporaries and is an excellent colorist. He was moreover an admirable brushman, who possessed the art of accentuating the beauty of his female sitters while preserving a good likeness. Of his favorite model, the beautiful Emma Hart, afterward Lady Hamilton, he painted some 30 portraits, many of which are in fanciful poses. There is little doubt that the elderly painter was in love with "the divine lady," as he always called her.

Most of Romney's finest paintings are in private possession. The most important of those in public collections are: "The Parson's Daughter" and a study of Lady Hamilton as a bacchante, in the National Gallery, London; "Perdita," in the Wallace collection; and in the Metropolitan Museum, New York, are the beautiful Mrs. Fitzherbert, Lady Hamilton as Daphne, and Mrs. Scott-Jackson (Morgan collection). Well-known examples in British private possession include the children of the Earl of Gower, Mrs. Russell and child, Lady Prescott and family, Lady Arabella Ward, Lady Cavendish Bentinck, and the Countess of Derby. Others in private possession in America are: Miss Finch Hatton and Lady Milnes (Frick collection, New York); Caroline Viscountess Clifden and her sister (H. E. Huntington, New York); Lady Warwick and her children.

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ROMNY, rôm'nê. A town in the Government of Poltava, Russia, 110 miles northwest of Poltava (Map: Russia, D 4). It has extensive manufactures of tobacco and flour. Its fairs are also important. Pop., 1911, 33,264.

ROM'OLA. A novel by George Eliot (1863), which appeared in the *Cornhill Magazine*, 1862–63. The scene is laid in Florence in the fifteenth century, the time of Savonarola, who plays an important part in the story.

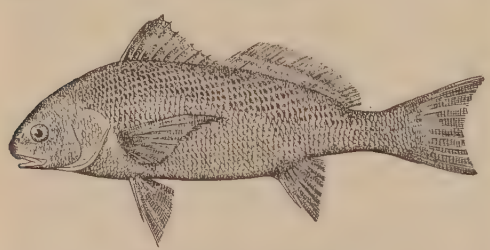
ROMORANTIN, rô'mô'răN'tăN'. The capital of an arrondissement in the Department of Loir-et-Cher, France, 39 miles southwest of Orléans (Map: France, N., G 5). It has important manufactures of cloth. The edict issued from here in 1560 prevented the establishment of the Inquisition in France. Pop., 1901, 8130; 1911, 8374.

ROM'ULUS. The mythical founder of Rome. (See ROME, *History*, second paragraph.) According to the tradition there had ruled at Alba Longa a line of kings descended from Æneas. One of these left the Kingdom to his eldest son, Numitor. Amulius, a younger brother of Numitor, deprived the latter of the sovereignty, murdered his only son, and compelled his only daughter, Silvia (generally called Rhea Silvia), to become a vestal virgin. Silvia having become the mother of twins by the god Mars, the fears of Amulius were aroused, and he caused the cradle containing the babes to be thrown into the Tiber. The cradle was stranded at the foot of the Palatine Hill, and the infants were saved by a she-wolf which carried them into her den and suckled them, while a woodpecker brought them food. Faustulus, the King's shepherd, who bore the infants home to his wife, Acca Larentia, had them brought up with his own children. In a quarrel between them and the herdsmen of Numitor, Remus, one of the twins, was taken prisoner and carried off to Numitor. Aided, however, by Numitor, who, through information given by Faustulus, recognized the twins as his grandsons, Romulus and Remus slew Amulius and placed Numitor on the throne. But Romulus and Remus loved their old abode on the banks of the Tiber and resolved to build a city there. The Palatine was chosen (by augury) for the site, and Romulus, yoking a bullock and a heifer to a plowshare, marked out the *pomœrium*, within which he proceeded to build a wall. Remus, to show its inefficiency, scornfully leaped over it, whereupon Romulus slew him. Romulus next erected a sanctuary on the Capitoline for runaway slaves and homicides. But wives were much wanted; and this led to the rape of the Sabine women—a wholesale abduction of virgins, the consequence of which was a series of wars, in which, however, Romulus was victorious, until Titus Tatius, at the head of a large army of Sabines, forced him to take refuge in his city on the Palatine. The treachery of Tarpeia (see TARPEIAN ROCK) placed the Capitolium in the hands of his adversaries. In the battle the next day the Sabine women rushed in between their husbands and their fathers and

implored them to be reconciled. They agreed, and henceforth resolved to form one people, the followers of Romulus dwelling on the Palatine, those of Titus Tatius on the Capitoline and the Quirinal. On the death of Titus Tatius Romulus became sole sovereign, and made successful war against the Etruscan cities of Fidenæ and Veii (q.v.). After a reign of 37 years Romulus was miraculously removed from earth. While he was standing near the Goat's Pool, in the Campus Martius, reviewing the army, the sun was eclipsed and he was carried up to heaven in a chariot of fire by his father Mars. Some time after he reappeared in a vision to one of the Romans, announced the future glory of the Roman people, and promised that he would watch it as guardian god, under the name of Quirinus (q.v.). The festival of the Quirinalia, February 17, was instituted in his honor, but the nones of Quintilis (July 7) was the day on which he was believed to have departed from earth. By the end of the Republic a sacred spot, marked by a black stone, by or upon the Comitium, near the Rostra, was pointed out as the grave of Faustulus or, as some said, of Romulus. Excavations in the Forum in 1898–99 brought to light in this neighborhood a rectangular pavement of black marble, about 10 by 13 feet in dimensions, which for various reasons it seems safe to identify with this monument. See FORUM; and consult Livy, i, 4–16; Hülsen-Carter, *The Roman Forum* (Eng. trans., Rome, 1909); and the article "Romulus and Remus" in Fr. Lübker, *Reallexikon des klassischen Altertums* (8th ed., Leipzig, 1914).

RON'ALDSHAY, NORTH and SOUTH. Two of the Orkney Islands (q.v.).

RONCADOR, rōn'kȧ-dōr' (Sp., snorer, grunter), or RONCO. A name in California for several fishes of the family Sciænidæ (see DRUM), which furnish both food and sport. The principal one is *Roncador stearnsii*, from 2 to 3



RONCADOR (*Roncador stearnsii*).

feet long when full-sized, and highly esteemed. Another species is the red roncador (*Corvina saturna*).

RONCAGLIA, rōn-kä'lyȧ. A village in the Province of Piacenza, Italy, noted for the diets and reviews which the Holy Roman emperors held here, on the Roncaglian Fields. See LOMBARD LEAGUE.

RONCESVALLES, *Sp. pron.* rōn'thĕs-vȧl'yȧs (Fr. *Roncevaux*). A pass in the Pyrenees between Pamplona and Saint-Jean-Pied-de-Port. Here the rear guard of Charlemagne's army was defeated in 778. See ROLAND, THE SONG OF.

RONCIÈRE LE NOURY, LA. See LA RONCIÈRE LE NOURY.

ROND, JEAN LE. See D'ALEMBERT.

RONDA, rōn'dȧ. A town of south Spain, in the Province of Malaga, situated 42 miles north of Gibraltar, on the railroad between that place and Granada (Map: Spain, C 4). It is very picturesquely located among lofty mountains, and the town is divided by a gorge 300 feet wide and nearly 600 feet deep, at the bottom of which rushes the Guadalevín River. The town is surrounded by olive groves and vineyards and has a delightful climate. It is a very old town, with well-preserved remains of Moorish walls and towers and many Moorish buildings. The chief industries are flour milling and wine production. Pop., 1900, 20,822; 1910, 22,692.

RONDANIN. See POMFRET.

RONDEAU, rôn'dō' (Fr. *rondeau*, from OF. *rondel*, round plate, cake, scroll, dim. of *rond*, round, from Lat. *rotundus*, round, wheel-shaped, from *rota*, wheel). A French form of versification. The rondeau consists of 13 verses, 8 on one rhyme, 5 on another, separated by a pause at the fifth verse and by another at the eighth. The first word or words are repeated after the eighth and the thirteenth verses. The *rondeau redoublé*, or doubled rondeau, is a poem of 20 verses in 5 quatrains. The four verses of the first quatrain made successively the last verse of the other quatrains. Sometimes a sixth quatrain, called the *envoi*, is added, after which the first word on the first half-verse of the poem is repeated. The rondeau was a favorite form of Adam de la Halle (q.v.) and of Guillaume de Machault (q.v.) and was cultivated by many other poets. In England the rondeau was skillfully revived by poets like Rossetti and Swinburne, Austin Dobson, and Andrew Lang. It had been used as early as Chaucer (c.1340–1400), and later by Hoccleve (c.1370–c.1450), by Lydgate (c.1370–c.1451), by Charles of Orléans in both his French and English poems (but with 14 lines), and by others. What is known as the rondeau of Villon has only 10 lines. Consult Gleeson White, *Ballades and Rondeaus* (London, 1887). For the musical form of similar name, see RONDO.

RON'DO (It., from Fr. *rondeau*, roundel). One of the oldest and most generally used of the musical forms, characterized by the constant recurrence of one principal theme. The oldest rondos of the sixteenth century consisted of a plain theme of four bars, which was followed by a few bars of interlude, when the original theme was repeated. Soon the theme itself was lengthened to 8 or 16 bars, and the interlude avoided the principal key. Then the intermediate passage appeared as a fully developed second theme in a related key. The fundamental idea of the rondo as established by Beethoven is (denoting the three themes by A, B, C respectively): A, B (in key of dominant), A, C, A, B (in key of tonic), coda. On its second and third recurrence A appears in different keys. Also, in order to avoid monotony, Beethoven does not repeat literally. When only two themes are employed the following may be given as the fundamental schedule: A, B, A (in key of B), B (in key of A), A. Under later composers (notably Chopin) the rondo form becomes even more elastic. It is frequently used for the final movement of symphonies and sonatas, and almost invariably for that of concertos.

RONGE, rôn'ge, JOHANNES (1813–87). The principal founder of the German Catholics (q.v.). He was born at Bischofswalde, Silesia, was educated at Breslau, entered the Roman Catholic priesthood, and was settled at Grottkau when he published criticisms of the relation between

Rome and the Breslau Cathedral chapter and was suspended in consequence (1843). He then went to Laurahütte in Upper Silesia as a teacher, and while there the exhibition of the holy coat (q.v.) at Treves so stirred his ire that he denounced it in print (1844) and was excommunicated. The agitation occasioned by his action led to the founding of the German Catholic church, and he became pastor of the German Catholic church at Breslau in 1845. Ronge took part in the political struggles of 1848 and was prominent as a democratic leader. From 1849 to 1861 he was a fugitive in consequence of his political activities. When permitted to return he went to Breslau, and in 1863 to Frankfort, and endeavored to revive the waning German Catholicism. In 1873 he removed to Darmstadt and there edited a paper in promotion of his plans. Consult *The Autobiography and Justification of J. Ronge, Translated from the Fifth German Edition* (London, 1846).

RONGER, rôn'zhâ', Florimond. See Hervé.

RONGS. A Tibetan people. See Lepchas.

RONSARD, rôn'sär', Pierre de (1525–85). A leading French poet and literary reformer. He was born Sept. 2, 1525, at La Poissonnière (Vendômois), of which his father Louis de Ronsard was seigneur. Ronsard received his early education at home and at the Collège de Navarre, which he entered in January, 1536. He became page of the Dauphin in August, 1536, a few days before the death of this Prince at Tournon. The young page then became attached to Charles, Duke of Orléans, who transferred him to the service of his sister, Madeleine de France, on her marriage to James V of Scotland, Jan. 1, 1537. Ronsard accompanied Madeleine to her future home and witnessed her death immediately after her arrival at Linlithgow. In the autumn of 1538 Ronsard returned to France, only to go back to Scotland on December 24 following. Once more he directed his way to his native country in the autumn of 1539, and after six months' travel in England he reached Paris in March or April, 1540, when he was advanced by the Duke of Orléans from the condition of page to that of *écuyer d'écurie*. The following May he accompanied the great Ambassador and humanist Lazare de Baïf on a secret mission to Haguenau, where an assembly had been convoked for the purpose of uniting the Catholics and Protestants. Though the mission of Baïf failed, Ronsard came to know some of the most distinguished humanists of the time. The future poet returned home broken in health, never to undertake another journey to foreign lands. As a result of an illness Ronsard became deaf and was obliged to give up his ambition for a career at court. In 1542 he wrote his first Horatian odes in order to rival the translations of the Psalms by the court poet, Clément Marot (q.v.). In March, 1543, Ronsard was present at the funeral of Guillaume du Bellay at Mans, and immediately afterward received the clerical tonsure. It was there also that he met the secretary of the Bishop of Mans, Jacques Peletier, who advised him not to study the humanities, but to write in French. Peletier also published a poem of Ronsard, the first of the latter's works to be printed, in his *Œuvres poétiques* in 1547. In 1544 Ronsard entered the home of Lazare de Baïf at Paris, where he began the study of Greek in company with the Ambassador's son, Jean Antoine de Baïf (q.v.) under the direction of the humanist Jean Daurat (q.v.). Three years later Joachim du Bellay (q.v.) joined the two young scholars at the Collège de Coqueret, of which Daurat had become the principal. It was there that the famous Pléiade (q.v.) was formed and that their manifesto, the *Défense et illustration de la langue française*, which inaugurated the classic reform, was written and published in 1549. After publishing some minor pieces Ronsard issued his first collection of poems, the *Odes*. This was followed by the *Amours de Cassandre* (1552), the popularity of which aroused the hostility of the court poet Mellin de Saint-Gelais (q.v.). A few years later came the *Hymnes* (1555, 1556), and in 1560 the poet issued the first edition of his complete works in four volumes. The *Elégies, mascarades, et bergeries* appeared in 1565, as well as the *Abrégé de l'art poétique*, in which the poetic theories of the new school were laid down in definite form. In the religious wars Ronsard was a partisan of Catholicism, arousing thereby the hostility of the Huguenots (q.v.) who set up as his rival his famous disciple Du Bartas (q.v.). Charles IX made Ronsard his court poet and suggested the composition of the *Franciade* (1572), an unfinished epic. Thereafter Ronsard spent his time principally in altering his earlier works and writing occasional poems. His last years were passed in lettered ease at his priories of Croix-Val and Saint-Cosme, at which latter place, near Tours, he died in December, 1585, after having made a final collection of his works (1584). Ronsard was called the prince of poets by his contemporaries. He received costly gifts from Queen Elizabeth of England and from her prisoner, Mary Queen of Scots, and was visited by Tasso, who consulted him on the *Gerusalemme*.

Ronsard was a master in poetic imagination and in the technique of language and metre. He was most successful in his amatory poems, though he will also rank among the leading poets of France in his love for nature. He was among the first to popularize the sonnet and restored the Alexandrine line to due honor. His lyrics have the naïveté of the Renaissance, a free, healthy naturalism, in which there is hardly a morbid strain. Ronsard, scorned by Boileau (q.v.) and the eighteenth century, has regained appreciation, thanks to the Romantic poets and critics of the nineteenth century.

Ronsard's works were printed seventeen times before 1630, and have since been well edited by Blanchemain (8 vols., Paris, 1857–67), Marty-Laveaux (6 vols., ib., 1887–98), and Pifteau (ib., 1891). A critical edition of his works has been announced by Laumonier for the Société des Textes Modernes, two volumes appearing in 1914. H. Vaganay issued the first two volumes of his edition of Ronsard's complete works (Strassburg, 1913). His biography was first written by Binet in 1586, critically edited by Evers (Philadelphia, 1905) and Laumonier (Paris, 1910). Good critical estimates of Ronsard are Laumonier, *Ronsard, poète lyrique* (ib., 1909), and Jusserand, *Ronsard* (ib., 1913). Other critical and biographical studies of importance are: Mellerio, *Lexique de Ronsard* (ib., 1895); Faguet, *Seizième siècle* (ib., 1894); Piéri, *Pétrarque et Ronsard* (Marseilles, 1895); Sainte-Beuve, *Causeries du lundi*, vol. xii; C. H. Page, *Songs and Sonnets of Pierre de Ronsard* (Boston, 1903), an excellent translation into English verse; Wyndham, *Ronsard and the*

Pléiade (London, 1906); Bauer, *Die Elegien Pierre de Ronsards* (Leipzig, 1907); *Les Amours de Pierre de Ronsard*, edited by Vaganay (Paris, 1910); id., *Œuvres meslées de Ronsard* (Lyons, 1914); H. Longnon, *Pierre de Ronsard* (Paris, 1912). Good bibliographies may be found in Laumonier, *Tableau chronologique des œuvres de Ronsard* (ib., 1911); Lanson, *Manuel bibliographique de la littérature française moderne*, vols. i, v (ib., 1909–14); Tilley, *Literature of the French Renaissance* (2 vols., Cambridge, 1904); Morf, *Geschichte der französischen Literatur im Zeitalter der Renaissance* (2d ed., Strassburg, 1914).

RONSDORF, rôns'dôrf. A town and railway station in the Rhine Province of Prussia, 3 miles southeast of Elberfeld. It is largely engaged in manufacturing, having ironworks, foundries, machine shops, copper works, ribbon mills, dyeing establishments, etc. Pop., 1910, 14,753.

RÖNTGEN, rēnt'gen, Wilhelm Konrad (1845–). A German physicist, born at Lennep in Rhenish Prussia. He received his doctor's degree in 1869 at the University of Zurich, where he studied under Kundt. He was afterward professor at Hohenheim, Strassburg, and Giessen, and in 1885 he became professor at the University of Würzburg. In 1899 he was appointed professor of experimental physics at the University of Munich. In November, 1895, he read before the Physico-Medical Society of Würzburg a paper upon his discovery of the rays which bear his name. For this discovery he received many honors, including the Rumford medal of the Royal Society of London and the Barnard medal of Columbia University, awarded in 1900 for the greatest discovery in science during the preceding five years. (See X Rays.) He published, chiefly in the *Annalen der Physik und Chemie*, many articles on various physical subjects, including the properties of crystals, specific heat of gases, absorption of heat ray in vapors and gases, electrostriction, piezo-electricity, and telephony. In 1901 he was awarded the Nobel prize for physics.

RÖNTGEN RAYS. See X Rays.

ROOD (AS. *rōd*, pole, crucifix, OHG. *ruota*, Ger. *Rute*, rod; possibly connected with Lat. *radius*, staff, Skt. *rudh*, to grow). A measure of surface. It is the fourth part of an acre and contains 40 square poles or perches.

ROOD. The cross on which Christ suffered; in modern usage the name is applied to the large and striking crucifix, generally with standing figures of Mary and John on either side of it, which was placed at the entrance of the choir or chancel in most mediæval churches. Often it stood on a gallery or screen, known as the rood loft or rood screen. Consult Pugin, *Treatise on Chancel Screens and Roodlofts* (London, 1851), and Bond, *Screens and Galleries in English Churches* (ib., 1908).

ROO'DEBOK'. See Palla.

ROOD, Ogden Nicholas (1831–1902). An American physicist, born at Danbury, Conn. After graduating at Princeton in 1852 he studied at the universities of Munich and Berlin and was made professor of physics and chemistry at Troy University (1858) and professor of physics in Columbia College (1863). He was elected a member of the National Academy of Sciences in 1864 and served as vice president of the American Association for the Advancement of Science (1868). His investigations embraced problems in mechanics, electricity, optics, and acoustics. He was the first to construct fluid prisms of great dispersive power for use in spectroscopic studies, and was also one of the first to apply photography to the microscope. His investigations on the nature of the electric spark and duration of lightning flashes are valuable, as they determined most accurately minute intervals of time. He constructed an air pump which for many years held a record for high vacua, and devised a method of photometry which was independent of color. Professor Rood was able to demonstrate the regular or specular reflection of X rays and also investigated materials of high electrical resistance. He wrote *Modern Chromatics* (New York, 1874), a standard work on color, and many scientific papers, published for the most part in the *American Journal of Science*.

ROOD SCREEN. See Choir Screen.

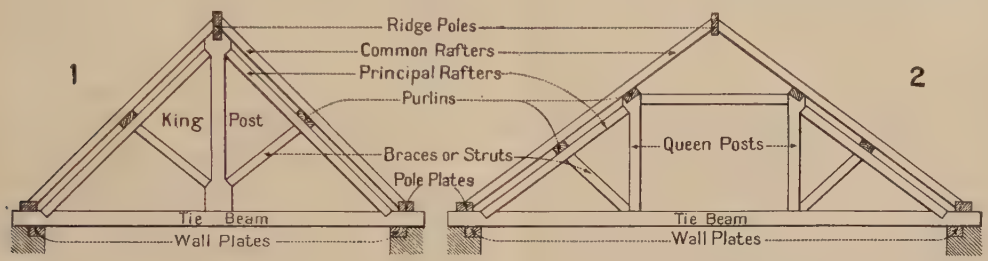
ROOF (AS., Icel. *hrōf;* probably connected with Gk. κρύπτειν, *kryptein*, to hide). The topmost covering of a building, including its supporting framework. The commoner forms of roof are the gabled, having two slopes meeting in a horizontal ridge and terminated at the end walls by triangular gables or pediments; the hipped roof, which has four sloped surfaces rising from the four walls to the short central ridge; the gambrel, with a double slope on either side, the lower part steep, the upper part flatter; the mansard, which is a hipped gambrel roof with a nearly flat upper slope. Other roofs form pyramids or cones, which are called spires when very lofty and relatively slender. A roof of convex form on a round or polygonal plan is called a dome or cupola; if formed with a double curve it is sometimes called a bell roof. A roof of a single slope from a higher to a lower side wall is called a lean-to, pent, or shed roof; such are the roofs of most side aisles of churches.

The construction of roofs varies with material and span. The simplest are the primitive flat roofs of the Orient, made with crossbeams, thatch, and a heavy layer of stamped clay. In central Syria and in Egypt important buildings were roofed with enormous beams and slabs of stone. The Greeks employed a low-pitched gable roof, carried by simple trusses of wood and covered with tiles of marble or terra cotta. The Romans were the first to span broad halls with vaults and domes of brick or concrete, covered probably with cement and lead for protection from the rain; they also used roofs carried by elaborate timber trusses and covered with tiles or with bronze plates. It was in the mediæval cathedrals that the system was developed of an inner covering or ceiling of stone vaulting, with an outer protective roof of timber trusses sheathed with boards and covered with copper, lead, slate, or tiles; these roofs were of a very steep pitch. At the same time there were built many roofs without the stone vaultings, the timber supporting trusses being exposed to view and decoratively treated (open-timber roofs, q.v.) and the spaces between them richly paneled. Since the Renaissance it has been customary to hide the roof behind a decorative ceiling of plaster or of paneled woodwork; on the other hand, the external roof has received much attention, and its form and decorative treatment are important elements in the design of many modern edifices. In those, however, of Italian classic type the roof is kept nearly flat and masked by balustrades and parapets. Flat roofs naturally predominate in tropical and

subtropical climates; steep roofs in regions of much rain or snow, as in northern Europe.

The structural design of the roof has in all ages been one of the determining factors in architectural development. In modern practice, although wood is by far the commonest material used, steel takes its place for structures of great span, and by its use spaces 376 feet wide have been roofed without intermediate supports (Liberal Arts Building, Chicago Columbian Exhibition, 1893). For such roofs arched trusses are used. Iron and steel roofs of 250 feet span are not uncommon in railway stations. The largest vaulted roof is that of the Pantheon at Rome, a dome 142 feet in diameter. See DOME.

In ordinary roof construction the truss is of the king-post type (Fig. 1) for spans up to 35 feet, or the queen-post type (Fig. 2) for spans up to 60 feet, though there are more complex types. Horizontal beams resting on these are called purlins; these carry the jack (common) rafters; to these last is nailed the sheathing,



1. KING-POST ROOF. 2. QUEEN-POST ROOF.

which is covered by the roofing. The roofing may be of tar and gravel, of tin or of copper (for nearly flat roofs), of shingles, slates, metal tiles, or terra-cotta tiles for steep roofs. The part of the roof which projects over the wall is called the eaves, and the trough for carrying off the rain water the gutter. Consult: Denfer, *Couverture des édifices* (Paris, 1893); Merriman and Jacoby, *Roofs and Bridges* (New York, 1896); Kidder, *Building Construction and Superintendence* (ib., 1906).

ROOFING FELT. See FELT.

ROOK (AS. *hrōc*, OHG. *hruoh*, rook; connected with Goth. *hrōkjan*, to crow, Skt. *kruc*, to cry out). A species of crow (*Corvus frugilegus*), common in the southern parts of Britain and found in many parts of Europe and Asia, even to Japan; about the same size as the common crow, but distinguished from it, even at a distance, by its color, which is a glossy, deep-blue black, in certain aspects grayish. On a nearer view a distinction is found in the naked warty skin at the base of the bill, extending back rather beyond the eyes and far down on the throat. The rook is gregarious, and very large companies assemble in rookeries, making their nests in close proximity, generally in tall trees, the same tree often sustaining many nests. Most cities or large towns in Great Britain have rookeries, sometimes of considerable magnitude. In their habits rooks are like American crows. Consult writings of European naturalists, especially, as to the flocking, Selous, *Bird Watching* (London, 1901).

ROOK, EDWARD FRANCIS (1870–). An American landscape painter. He was born in New York City and studied in Paris under Laurens and Constant. After his return to the United States he became identified with the group of painters residing in and near Old Lyme, Conn. Good examples of his work, which is characterized by a simple, poetic rendition of nature, are "Deserted Street, Moonlight," in the Pennsylvania Academy, Philadelphia, and "Pearl Clouds, Moonlight," in the Cincinnati Art Museum. In 1898 he was awarded a gold medal at the Pennsylvania Academy of Fine Arts and in 1904 two silver medals at the St. Louis Exposition. He became an associate of the National Academy of Design.

ROOKE, SIR GEORGE (1650–1709). An English admiral. He was born near Canterbury. Entering the navy, he saw service against the Dutch, and in 1689 was promoted to the rank of rear admiral. He was engaged in the action off Beachy Head in 1690 between the Earl of Torrington and the French admiral Tourville, and in 1692, in the battle of La Hogue, fought between the French fleet and the combined English and Dutch force under Admiral Russell, led the night attack on the enemy's fleet which resulted in the burning of 13 French ships. For his services on this occasion he received the rank of vice admiral of the red, the honor of knighthood, and a pension of £1000 a year. His next important service was the destruction of a Franco-Spanish plate fleet in the port of Vigo; and in July, 1704, in conjunction with Sir Clowdisley Shovell, he captured Gibraltar (q.v.). A few days later, off Malaga, he fought an indecisive battle with a French fleet of superior force under the Comte de Toulouse. He retired from the service in February, 1705, and died Jan. 24, 1709. Consult *The Life and Glorious Actions of Admiral Sir George Rooke, M.P.* (London, 1707; new ed., 1713), and J. K. Laughton, *From Howard to Nelson* (ib., 1899).

ROON, rōn, ALBRECHT THEODOR EMIL, COUNT VON (1803–79). A Prussian field marshal and war minister, born at Pleushagen, near Kolberg. He was trained at the military school in Berlin and in 1836 was appointed to the general staff with rank of captain. In 1858 he became lieutenant general. In 1859 he was made Minister of War and in 1861 became also Minister of Marine, holding that office for 10 years. The splendid effectiveness of the German army in 1866 and 1870–71 was due in great measure to Von Roon's talents as an organizer. On Jan. 1, 1873, he was made President of the cabinet and field marshal. He resigned Nov. 9, 1873, the Ministry of War and the presidency of the cabinet, as Bismarck found it necessary to combine his position as Imperial Chancellor with that of President of the cabinet. Von Roon, who was a pupil of Karl Ritter, wrote a number of authoritative geographical works, the

best known of which is the *Anfangsgründe der Erd-, Völker- und Staatenkunde* (1834). Consult Waldemar Count Roon, *Denkwürdigkeiten aus dem Leben des General-Feldmarschalls Grafen von Roon* (2 vols., Breslau, 1892), and id., *Kriegsminister von Roon als Redner* (ib., 1895–96).

ROOS, rōs. A family of German animal painters, of whom the most important is Johann Heinrich (1631–85), born at Otterberg in the Palatinate. He studied under Juliaen du Jardin, Barend Graat, and Adriaen de Brie in Amsterdam, and after visiting Italy settled at Frankfort. In 1673 he was appointed court painter to the Elector Palatine. Roos painted animal pieces, usually sheep, with romantic landscapes—a subject which became a specialty of the family. His works, which are carefully drawn, but often cold and hard, are to be found in most German galleries, while two are in the New York Historical Society. He also etched about 44 plates.

His son and pupil, Philipp Peter (surnamed Rosa di Tivoli) (1651–1705), born at Frankfort, painted in his earlier period in the style of his father, but after studying in Rome under Brandi he adopted a broader, more decorative manner and a heavy brown tone. He has numerous paintings in Roman and German galleries. Johann's three other sons, the best of whom was Johann Melchior (1659–1731), also painted animals with landscape.

ROOSA, rōō'sȧ, Daniel Bennett St. John (1838–1908). An American physician, born at Bethel, N. Y. He graduated in 1860 at University Medical College, New York, was assistant surgeon in the Fifth New York Volunteers' three-months troops, became resident surgeon at the New York Hospital in 1862, and in 1864 began practice in New York City. From 1863 to 1882 he was professor of diseases of the eye and ear at his alma mater, and from 1875 to 1880 held a similar chair in the University of Vermont (Burlington). In 1888 he was appointed professor of diseases of the eye in the New York Post-Graduate Medical School, of whose faculty he also became president. He wrote: *A Practical Treatise on the Diseases of the Ear* (1873; 6th ed., 1885); *The Determination of the Necessity for Wearing Glasses* (1887); *Handbook of the Anatomy and Diseases of the Eye and Ear* (1904), with A. E. Davis; *Text-Book of the Diseases of the Ear, Nose, and Pharynx* (1905), with B. Douglass.

ROOSEVELT, rō'z'-vĕlt. A borough in Middlesex Co., N. J., situated 16 miles from New York City, with a deep-water frontage on Staten Island Sound, on the Rahway River and on the Central of New Jersey Railroad. It was founded in 1906 when the districts of Carteret, Chrome, and East Rahway were consolidated to form the borough of Roosevelt. The place is noted for its manufactures, which include steel, chemicals, fertilizers, metal goods, oil, cigars, creosote, paints, etc. Pop., 1910, 5786; 1915 (State census), 8083; 1920, 11,047.

ROOSEVELT, Nicholas J. (1767–1854). An American inventor. He was born in New York City. His claim to distinction is based upon his invention of the vertical paddle wheel for steamboats. As early as the Revolution he used the idea in a small boat in which there were two side wheels that were turned by springs. In 1797, together with R. R. Livingston and John Stevens, he built a steamboat; but as, contrary to his advice, chains and floats were used instead of paddle wheels, the boat proved a failure. Financial difficulties prevented him from following out his idea, and ultimately Robert Fulton adopted it with success. In 1809 Roosevelt, after considerable controversy with Fulton, entered into a partnership with him for the introduction of steamboats on western waters. Two years later Roosevelt built at Pittsburgh the boat *New Orleans* and successfully navigated her down the Ohio and the Mississippi to New Orleans. He was the great-uncle of R. B. Roosevelt and great-grand-uncle of Theodore Roosevelt. Consult B. H. Latrobe, "A Lost Chapter in the History of the Steamboat," in *Maryland Historical Society Fund Publications*, vol. v (Baltimore, 1871).

ROOSEVELT, Robert Barnwell (1829–1906). An American author and reformer. He was born in New York City and was the grand-nephew of Nicholas J. Roosevelt and an uncle of Theodore Roosevelt. He was admitted to the bar in 1851. In 1867 he brought about the formation of the New York State Fishery Commission, and until 1888, when he became United States Minister to Holland, was one of its commissioners. He first entered politics as an opponent of the Tweed Ring, and as an organizer of the Committee of Seventy, as vice president of the Reform Club, and as an editor of the *Citizen*, he did much to break up that organization. He was a member of the Lower House of Congress in 1873–75 and served as treasurer of the Democratic National Committee in 1892. He published: *The Game Fish of North America* (1860); *The Game Birds of the North* (1866); *Superior Fishing* (1866; new ed., 1884); *Florida and the Game Water Birds* (1868); *Progressive Petticoats* (1871).

ROOSEVELT, Theodore (1858–1919). The twenty-sixth President of the United States. He was born in New York City, Oct. 27, 1858, of a distinguished family (see Roosevelt, N. J. and R. B.) of Dutch origin. He graduated at Harvard in 1880 and afterward attended Columbia Law School. Of independent means, he joined the Republican party in 1880 for the sake of a career. As a regular Republican he was elected in 1881 to the New York Assembly, of which he was the youngest member. Reëlected in 1882 and in 1883, he identified himself with the antimachine reform element and established himself as a fighter and leading opponent of crookedness. Roosevelt was nominated for Speaker in 1882 by the minority, but failed to retain leadership when his party was in majority the next year. He was a delegate to the Republican National Convention of 1884, where he fought for the presidential nomination of George F. Edmunds (q.v.). For two years after this he conducted a ranch at Medora, N. Dak., but, having remained in close touch with New York City politics by residing there during the winters, he became the Republican candidate for mayor in 1886. His opponents were Henry George, Single-Taxer, and Abram S. Hewitt, Democrat, the successful candidate. As a member of the United States Civil Service Commission (1889–95), appointed by President Harrison and retained by Cleveland, he did much to extend the merit system on a basis of applied idealism, as he called it. During the next two years (1895–97), while president of the police board of New York City, he employed energetic measures to eradicate corruption and enforce

Sunday liquor laws and, in company with Jacob Riis (q.v.), to remedy conditions in the tenement districts. President McKinley recalled Roosevelt to national service in 1897 as Assistant Secretary of the Navy. In this office his work was of signal value in bringing the navy to partial readiness for the war with Spain. After resigning his office in April, 1898, he was active in organizing the First United States Volunteer Cavalry. This regiment, popularly known as the Rough Riders, Roosevelt (colonel since the action at Las Guasimas) led in a famous charge up San Juan Hill, near Santiago, Cuba. Earlier he had been lieutenant colonel under his intimate friend Leonard Wood (q.v.).

When his command was mustered out in the summer of 1898, after four months' service, Colonel Roosevelt returned to New York in time to begin an active campaign as the Republican nominee for Governor of the State. He was elected by a plurality of 18,079 over Augustus Van Wyck, the Democratic candidate. His first important act as Governor was to investigate the State canal system, concerning which there had been much talk of fraud in the preceding administration, and to induce an unsympathetic Legislature to appropriate $200,000 for a new survey and an accurate estimate of the proposed improvements. By his advocacy of the Ford Franchise Law, providing for the taxation of corporation franchises, he incurred the enmity of some of the largest corporate interests; nor were the political leaders pleased by an extension of the civil-service system to include many offices hitherto under their control. Although he expressed a desire for a second term as Governor, in which to complete the reform barely begun, Roosevelt was nominated for Vice President on the ticket with President McKinley and was elected in November of the same year. Senator T. C. Platt (q.v.) asserted that in order to rid himself of Roosevelt as Governor he forced him to accept this nomination. Roosevelt's speeches in the campaign brought him into great prominence and contributed powerfully to the success of the ticket.

When he became President upon McKinley's death, Sept. 14, 1901, he undertook to conduct his administration as a continuation of that of McKinley (q.v.). The plans for trust legislation were adhered to, and efforts were made to effect reciprocity treaties with other countries. The Philippine policy was maintained and a partially autonomous government was provided for the islands. The construction of an isthmian canal was also authorized, and the connection of the Philippine Islands with the United States was accomplished by means of a submarine cable. In 1903, after Colombia had rejected the treaty recently negotiated and after a revolution had occurred in Panama, the President recognized Panama as a republic and promptly secured rights and territory for the construction of a canal. (See PANAMA CANAL.) His action at this time was considered by some to transcend the powers of the executive, but it was generally approved both at home and abroad. Legislation identified distinctively with Roosevelt himself dealt with the revision of the country's financial system, the increase of the navy as the best means of preserving peace between the United States and other powers, and the establishment of a permanent Census Bureau and of a Department of Commerce and Labor, whose Secretary should be a member of the cabinet. It was characteristic of his personal energy and diplomatic ability that during the paralyzing anthracite-coal strike of 1902 he should call together representatives of both parties and induce them to agree to the appointment of an arbitration commission. This was an act without precedent in the history of his office and was performed in the public behalf, to remedy a national evil. In the same year, through his speeches and messages, President Roosevelt had aroused a widespread demand for the regulation or dissolution of combinations between railroads and of all other combinations in restraint of trade. His campaign eventually brought striking results. See NORTHERN SECURITIES CASE; RAILWAYS; SHERMAN ANTI-TRUST LAW; TRUSTS; UNITED STATES, *History*.

So striking was the President's personality that it became the principal factor in the campaign of 1904. The Republican Convention in Chicago by acclamation nominated Mr. Roosevelt to succeed himself, and in the election of November he defeated his Democratic opponent, Judge Alton B. Parker (q.v.) of New York, by a popular majority of nearly 2,000,000 votes, the largest ever accorded a candidate. In the electoral college he received 336 votes to Judge Parker's 140. His second administration was marked by the same fruitful energy that had characterized the first. Largely through his personal intercession and good offices a peace, ending the Russo-Japanese War, was concluded at Portsmouth, N. H., between the envoys of the warring nations (1905). For this achievement he was awarded the Nobel peace prize of $40,000. With part of this amount he endowed the Foundation for the Promotion of Industrial Peace and $10,000 of it he gave in 1915 to the Interchurch Committee on Unemployment. He was also one of the agencies in bringing about the second Hague Peace Conference. In 1906 his great influence led Congress to pass bills to check unfair discrimination in railway rates and to secure the purity of food products. At the time of the great panic of 1907, when a corporation of much importance, the Tennessee Coal and Iron Company, was about to fail, the President, odd as it would appear, helped one of the biggest trusts to acquire more property. The United States Steel Corporation offered to buy the Tennessee Coal and Iron Company and thereby avert a complete collapse of the financial system. Roosevelt gave his sanction to this action as an emergency measure. There was little criticism of him at the time, but much unfavorable comment came later, when the time of stress was safely past. The latter part of his administration was marked by dissensions with Congress which grew, before its close, to actual hostility. It was generally conceded that it was his support in 1908 that secured the Republican nomination to Taft, a fact which the latter afterward admitted. The President himself declined to be a candidate again. After his retirement from office in 1909, he spent a year hunting big game in Africa, and he afterward presented to the National Museum, Washington, most of the valuable collection he made at this time. His return in the spring of 1910 was a kind of triumphal progress through Europe, unparalleled since Grant. Notable lectures were delivered by him at the Sorbonne, Paris, and at Berlin, Christiania, and Oxford universities.

While Roosevelt was away, occurred the Ballinger-Pinchot (qq.v.) controversy and the sharp

division of the Republican party into conservatives supporting Taft and insurgents opposing him. Both factions endeavored to secure Roosevelt's support. The recipient, upon his return, of a magnificent welcome from New York City, he occupied in the public mind a position unparalleled at the time—the one American known to all the world. In his own party, its recognized leader, he was the umpire to whom all turned. For a time he did not make public his intention relative to the party division over President Taft. For a few months he took no part in politics, but in 1910, throwing himself vigorously into the New York campaign, he was elected temporary chairman of the State convention which nominated for Governor his choice, H. L. Stimson (later Secretary of War under Taft). After he had made a tour of the State in support of Stimson, the defeat of the latter by John A. Dix, Democrat, was considered a severe blow to Roosevelt. So far the relations of Roosevelt and Taft were outwardly friendly. Roosevelt supported the Canadian reciprocity measure and the two stood together on the Lorimer (q.v.) scandal. The ex-President let it be known, however, that he approved Pinchot (Taft supporting Ballinger) and that he strongly opposed the treaties intended to secure peace by agreeing to arbitration on all issues. The conservative Republicans seemed to find a leader in Taft, and Roosevelt was certainly the dominant personality in the progressive group. These elements steadily drew apart. In 1910 Roosevelt made a tour of the country in which he enunciated the doctrine of the New Nationalism. By this principle he meant the achievement of national efficiency through the extension and development of the powers of the general government and through comprehensive reform. The reforms advocated were: abolition of the supposed "twilight zone" between the States and the national government; equalization of economic opportunity; conservation of resources (see CONSERVATION); regulation of "nationalized industry in the interests of the public welfare"; preparedness in military affairs; and a reorganization of the judiciary or the institution (through the recall or referendum or both) of greater popular control of the action of the courts—this in an effort to "educate" them up to an interest primarily in the welfare of human beings rather than in the security of property and contracts. In his famous Charter of Democracy speech in February, 1912, before the Ohio Constitutional Convention, Roosevelt added to his list direct nominations, preferential primaries, the initiative, the referendum, and the recall for judicial decisions as well as for officials. This programme became his platform. He claimed that his views accorded not only with those of Lincoln, but in certain respects with those of Jefferson as well.

So definite was the line of cleavage between the two divisions of the Republican party that a strong sentiment in favor of Roosevelt for the presidency developed. For some time, however, he supported La Follette (q.v.) and declined to commit himself; but finally, in answer to a letter from seven governors who in 1912 urged him to seek a nomination, he announced his candidacy. He entered the contest for delegates with characteristic vigor, and engaged in a violent struggle with Taft, whose victory, he claimed, was a clear steal. Thereupon, with his supporters as a nucleus and in an incredibly short time, he created the Progressive party (q.v.), assisted in its organization, and at Chicago received its nomination for the presidency. The campaign which followed was characterized by great energy and bitterness. Roosevelt denounced both the Republican and the Democratic parties as under the control of machine politics, and contended that his party was free from boss domination. He was sharply criticized for seeking a third term in violation of a pledge in 1904 that "under no circumstances" would he accept another nomination, but he stated that his objection had been to three consecutive terms. Three weeks before the election, while speaking in Milwaukee, he was shot by a fanatic, but was not seriously injured. In the election Roosevelt divided the Republican party in all the States and in 28 he had a majority over Taft. He received 88 electoral votes. Thus the successful candidate, Woodrow Wilson, received only a minority of the total popular vote.

After the election Roosevelt decided to make explorations in South America. While a guest and speaker in several important cities he did much to encourage a more cordial spirit of coöperation between the continents. After his return from the interior of Brazil he announced the discovery of a new river. See RIO TÉODORO.

In 1913 and after, Colonel Roosevelt appeared before the country as a critic of the foreign policy of President Wilson. He objected particularly to the "watchful waiting" attitude towards the Mexican factions and insisted that adequate protection be given to Americans and their property. On the outbreak of the Great European War he continued his criticism, alleging that in accordance with The Hague Convention of 1907, which the United States had solemnly ratified, it was the duty of the President to protest against the invasion of Belgium by Germany. He was decidedly anti-German in his attitude, and after the sinking of the *Lusitania* and other ships by German submarines, he urged that resort to force was the only course compatible with honor. At this time, as before, he was the advocate of military preparation on the part of the United States to meet obligations and protect interests. Such preparation, he declared, was the surest guarantee of peace.

In 1915 Roosevelt was a party to a dramatic libel suit. He was sued by William Barnes, Jr. (q.v.), publisher of the Albany *Evening Journal* and Republican party leader in the State, on the ground that he had charged Barnes with maintaining a corrupt alliance with corporations. The trial, at Syracuse, lasted for nearly four weeks, and unsavory parts of the State's political history were made public. The plaintiff produced letters by Roosevelt to Senator T. C. Platt (q.v.), written at a period when that Senator was the machine leader of the Republican party in New York State, to establish the charge that the association of Platt and Roosevelt had been close; but the latter claimed that he had used the aid of Platt to further the interests of the people. The case was decided in the defendant's favor. Two years earlier Roosevelt himself had been plaintiff in a libel suit. An editor of Marquette, Mich., persisted in giving sanction in his paper to rumors that the ex-President at times used intoxicating liquors in excess. Some of the best-known persons in the country testified for the plaintiff, and within a few days the editor retracted. Roosevelt did not press the suit, but

asked for and received a nominal judgment in vindication of his character.

Roosevelt's varied and extraofficial interests, in addition to those already mentioned, cannot be overlooked. Popularly he became known as an exemplar of the strenuous life, as wielder of the big stick, advocate of simplified spelling, opponent of race suicide, and enemy of nature fakers. To an extraordinary degree his personality impressed itself on the American people. His literary work is of high character both as to content and as to style and ranges from scholarly historical writing and brilliant political essays to entertaining narratives of his hunting experiences and contributions to natural science. In recognition of distinction he was elected president of the American Historical Association (1912) and was admitted to the American Academy of Arts and Letters. The articles which he wrote for the *Outlook* while contributing editor to this paper in 1909–14 were widely commented on. Books by him include: *The Naval War of 1812* (1882), a standard history of this war; *Hunting Trips of a Ranchman* (1885); *Life of Thomas Hart Benton* (1887); *Life of Gouverneur Morris* (1887); *Ranch Life and Hunting Trail* (1888); *The Winning of the West* (4 vols., 1889–96), an important presentation of pioneer history and life; *History of New York City* (1890); *Essays on Practical Politics* (1892); *The Wilderness Hunter* (1893); *American Political Ideals and Other Essays* (1897); *The Rough Riders* (1899); *Life of Oliver Cromwell* (1900); *The Strenuous Life* (1900); *Hunting the Grizzly* (1905); *African Game Trails* (1910); *True Americanism: African and European Addresses* (1910); *The New Nationalism* (1910); *Realizable Ideals* (1912), Earl Lectures; *Conservation of Womanhood and Childhood* (1912); *History as Literature, and Other Essays* (1913); *Through the Brazilian Wilderness* (1914); *Life Histories of African Game Animals* (1914); *America and the World War* (1915); also various works in collaboration. His writings were collected in 25 volumes. Consult Roosevelt's own *Autobiography* (New York, 1913); also J. A. Riis, *Theodore Roosevelt the Citizen* (ib., 1904); H. C. Lodge, in *Frontier Town and Other Essays* (ib., 1906); John Burroughs, *Camping and Tramping with Roosevelt* (Boston, 1907); James Morgan, *Theodore Roosevelt, the Boy and the Man* (New York, 1907); Albert Shaw, *Cartoon History of Roosevelt's Career* (ib., 1910); C. G. Washburn, *Theodore Roosevelt* (Boston, 1916).

ROOSEVELT DAM. See DAMS AND RESERVOIRS.

ROOT (AS., Icel. *rot*, root; connected with Lat. *radix*, Gk. *ῥίζα*, *rhiza*, Goth. *waúrts*, OHG. *wurz*, Ger. *Wurz*, AS. *wyrt*, Eng. *wort*). The underground part of vascular plants (pteridophytes and spermatophytes) which serves as an anchor in the soil and as an organ for receiving water. Among the lower plants there are certain organs of attachment (rhizoids) which, though structurally unlike roots, may serve as such. In duration roots are annual, biennial, or perennial; in form they are fibrous or fleshy, and in origin they are primary or secondary. Primary roots, which are usually single, and if persistent are called taproots, originate from the embryo; secondary roots arise later from the shoot. As to structure and function roots are classified as follows: soil roots are related to a soil medium and differ thereby from others; water roots are constructed for a water medium and may be developed by growing a terrestrial plant, e.g., a hyacinth bulb, in water; air roots are constructed for an air medium, e.g., the dangling roots of an epiphytic orchid; clinging roots are organized for climbing, as in the ivies; prop roots are sent out to support wide-

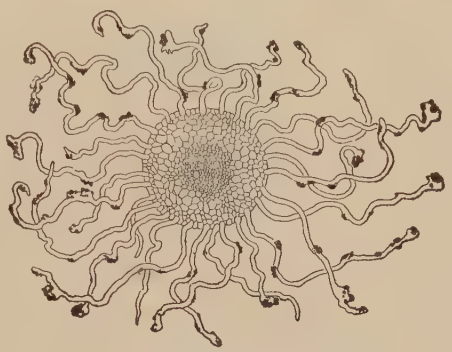


FIG. 1. CROSS SECTION OF YOUNG ROOT.
Showing root hairs with adherent soil particles.

spreading branches to enable them to spread farther, as in the screw pine, banyan, etc. Unlike stems, roots bear no leaves or foliar structures; do not increase in length by joints but by continuous multiplication and enlargement of apical cells; and their branches arise from the central woody cylinder.

In minute structure roots are still more distinct from stems. (See HISTOLOGY.) In general the tips bear more or less conspicuous root-

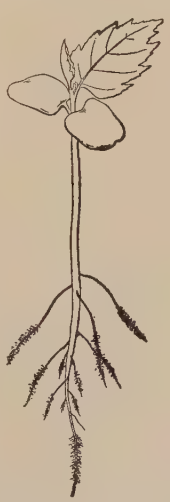


FIG. 2. PLANTLET.
Showing roots and root hairs.

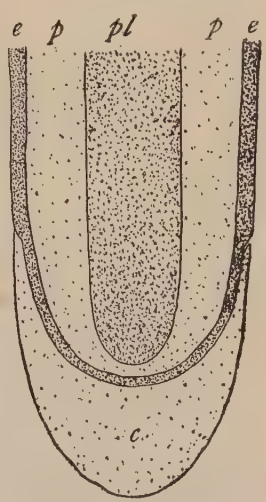


FIG. 3. DIAGRAM OF LONGITUDINAL SECTION OF ROOT TIP.
Showing dermatogen (*e*), periblem (*p*), plerome (*pl*), and rootcap (*c*).

caps composed of hoodlike masses of cells, which die and slough off in front and are renewed from behind (*c*, Fig. 3). This cap serves to protect the delicate growing tip as the root pushes its way through the soil. Just behind the rootcap are usually very numerous and delicate hairs, which are elongated outgrowths from the epidermal cells. They increase the absorbing surface of the root and are developed only in the

actively absorbing region near the tip. As the rootlet lengthens new root hairs appear near the tip and the older ones perish (Figs. 1, 2). Beneath the rootcap is the group of rapidly dividing apical cells, from which the tissues of the root are derived. Just behind the apical group the three embryonic regions of the root begin to differentiate (Fig. 3). In the centre is the plerome, an axial mass of cells that tend to elongate. When fully organized this becomes the stele, in which originate the vascular bundles or main conducting strands of the root. Surrounding the plerome is the periblem, that later becomes the cortex, in roots a very prominent region. The cortex is covered by a single layer of cells, the dermatogen, that later becomes the epidermis. The dermatogen gives rise to the rootcap. In most roots also the epidermis behind the rootcap is replaced by a modified outer layer of the cortex, called the epiblema. Probably the chief anatomical peculiarity of the root is the central and solid woody axis, whose tissues are arranged in a way which distinguishes the root from most stems. Early in the history of perennial roots secondary changes occur that greatly modify the general structure, especially in the appearance of growth rings, and assimilate it to that of stems. See HISTOLOGY.

ROOT. In philology (q.v.), that abstract form of a word which remains after all formative elements have been removed. In strict scientific discussion in Indo-European linguistics a root is regarded as pre-Indo-European, i.e., it is a hypothetical word derived not only by omission of all formatives, but also by comparison of all cognate words in the Indo-European languages. To speak of Greek, Celtic, or Germanic roots is, therefore, scientifically inaccurate. Roughly speaking *fōt* may be called the root of *foot*, but properly the root is the hypothetical Indo-European form **pōd*, as shown by a comparison of Skt. *pāda*, Av. *pāδa*, Armen. *otn*, Gk. *πούς*, Doric Gk. *πῶς*, Lat. *pēs*, Lith. *padas*, Goth. *fōtus*, OHG. *fuoz*, and AS. *fōt*. In all probability roots never had an actual existence.

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ROOT. In mathematics a number or expression resulting from the process of evolution. (See INVOLUTION AND EVOLUTION.) The values of the unknowns which satisfy an equation (q.v.) are also called the roots of the equation.

ROOT, ELIHU (1845–). An American lawyer and statesman, born Feb. 15, 1845, at Clinton, N. Y., where his father was professor of mathematics in Hamilton College. From this institution Elihu Root graduated in 1864. He studied law at New York University, received his degree in 1867, and soon gave evidence of remarkable legal talent. He was especially successful as a corporation lawyer. A stanch Republican in politics, he was United States district attorney at New York from 1883 to 1885 and in 1894 was a delegate at large to the New York State Constitutional Convention, acting as chairman of the judiciary committee. After his appointment (1899) as Secretary of War to succeed Russell A. Alger, he planned the new War College and reorganized the administrative system of the department, applied civil-service rules to the promotion of officers as far as practicable, and instituted the general staff. He continued in office during McKinley's second administration and under President Roosevelt until 1904, when he resigned. In 1903 he had served as member of the Alaska Boundary Tribunal. Having succeeded John Hay as Secretary of State in 1905, he represented the United States (July, 1906) at the Pan-American Congress in Rio de Janeiro and was honorary president of this body. Then and later he did much to strengthen the friendly commercial and political relations between Latin American countries and the United States.

In 1909 Root resigned his secretaryship and was elected United States Senator from New York. As counsel for the United States in the North Atlantic Fisheries Arbitration (1910), he contributed to the settlement of a long controversy with England. In 1910 also he was made a member of the permanent court of arbitration at The Hague and became president of the Carnegie Endowment for International Peace. The Nobel peace prize of 1912 was awarded to him. In the Republican National Convention of 1912 he was permanent chairman and was a leader of the adherents of President Taft, to whom he remained loyal after the bolt of Roosevelt and the formation of the Progressive party. Despite the protest of friends and party leaders, Root announced, in 1913, that he would not be a candidate for reëlection to the Senate; nor would he allow himself to be considered in connection with the Republican presidential nomination for 1916. However, in 1915, at the age of 70, he was president of the New York State Constitutional Convention and its dominant figure. Senator Root consistently opposed woman suffrage. In addition to the various posts of honor and responsibility already mentioned, he became president of the trustees of the Carnegie Institution, Washington, president of the American Society of International Law, of the American Bar Association (1915), and of the Union League Club, New York (1898–99, 1915). He also received many honorary degrees at home and abroad, including the Oxford D.C.L. In 1915 he was elected to the National Institute of Arts and Letters.

ROOT, GEORGE FREDERICK (1820–95). An American musician and composer, born at Sheffield, Mass. He studied music under George J. Webb, of Boston, after which he taught music in New York City (1844–45), where he was organist of the Mercer Street Presbyterian Church. In 1859 he became a member of the Chicago music firm of Root & Cady. He composed many popular songs and battle songs, notably "Battle Cry of Freedom," "Tramp, Tramp, Tramp," "Just Before the Battle, Mother," and the quartet "There's Music in the Air," besides which he edited numerous books of sacred music. Other works were the cantatas *Flower Queen* (1852) and *The Haymakers* (1857).

ROOT BARNACLES. See RHIZOCEPHALA.

ROOT PARASITES. Plants attached to the

roots of other plants, whose elaborated food they consume. They are usually without chlorophyll. In temperate climates the best known are probably broom rape and cancer root; in tropical countries, *Rafflesia* (q.v.). There are a large number of chlorophyll-bearing plants that are semiparasitic on the roots of other species. Many of the species of the Santalaceæ have this habit, *Comandra umbellata*, the bastard toadflax, being the best-known representative of this family in the United States. Species of *Rhinanthus*, the yellow rattle, and of *Euphrasia*, belonging to the family Scrophulariaceæ, are also semiparasitic on the roots of other plants.

ROOT PRESSURE. If while a plant is rapidly absorbing water by the root system, it be decapitated, water will soon ooze from the stump—a phenomenon known as bleeding. The amount may be measured, and the pressure under which it escapes may be ascertained. Since the pressure thus determined was first recognized as arising in the root system, the name "root pressure" was given to it. Since investigation shows, however, that cells of suitable character, located in any part of the plant, under proper conditions may develop a similar pressure, the terms "sap pressure" and "bleeding pressure" are superseding it. Sap pressure is dependent upon the osmotic pressure (see OSMOSIS) of active cells which adjoin xylem bundles (see ANATOMY), into which water escapes and travels to the point of exit under the pressure of additional quantities of water from behind. There is no satisfactory explanation of the action of the cells which thus force water into the xylem. Root pressure shows itself strikingly in the spring before the leaves are fully developed, when the sap often exudes from wounds, as in grapevines and many trees, in considerable quantities. After the development of the foliage and under conditions which permit transpiration (q.v.), root pressure becomes less or disappears. It is, therefore, not an important factor in lifting water when water is most needed.

The amount of water which may escape is often much greater than the volume of the root system. Thus, in two and a half days the stump of a stinging nettle gave off over 11 liters (11 quarts) of water, more than eight times the volume of the root system. A 12-year-old birch in seven days exuded from an opening in the trunk 36 liters of water. When the central bud is cut out, various species of century-plant exude water several months. A vigorous plant is said by Humboldt to yield as much as 1000 liters. The extrusion of water from the sugar maple in late winter or early spring is at first not due to root pressure, but rather to the expansion of gases in the twigs which are warmed during the sunny days. See SAP.

ROOT TUBERCLES. Irregular swellings upon the roots of Leguminosæ, the alder, and a few other plants. They are due to an infection by various bacteria or bacteria-like organisms. The ability of plants to assimilate the free nitrogen of the air was a subject of discussion among agricultural chemists for many years. Georges Ville seems to have been one of the first to maintain that certain plants can so assimilate, but he did not discover the true explanation. The claim of Ville was attacked by Boussingault, Lawes and Gilbert, and others, whose experiments seemed to give opposite results. Later Hellriegel (q.v.) proved by carefully conducted experiments that clovers and similar crops enrich the soil by adding nitrogen to it and that they obtain this nitrogen from the air through the intervention of bacteria which gain entrance through the root hairs. The action is reciprocal; the plant furnishes the carbohydrates necessary for the growth of the bacteria which, in turn, supply nitrogen to the host plant. (See SYMBIOSIS.) In this way, if the soil contains sufficient available nitrogen for the maximum development of the plant, few tubercles will be developed, but, well supplied with soil organisms, tubercles will be developed in abundance. The failure of Boussingault and others to observe any increase in nitrogen was due either to the absence of the microörganisms or to a large amount of available nitrogen in the soil, since the organism (*Bacillus radicicola*) is not always present in the soil. Two means for securing them have been developed. One, called soil inoculation, consists in scattering soil rich in these organisms over a field to be planted, and the other in the use of cultures of the organisms distributed on the seed or over the soil. This last method is in some ways preferable and has resulted in the commercial preparation of nitrogen, nitroculture, etc. See CLOVER; GREEN MANURING; LEGUMINOSÆ; NITROGEN.

ROPARTZ, rô'pärts', J. GUY (1864–). A French composer, born at Guingamp. At the Paris Conservatoire he was a pupil of Dubois and Massenet and later studied privately under César Franck. In 1894 he became director of the conservatory at Nancy and conductor of the symphony concerts. His compositions include several one-act operas, four symphonies, an *Etude Symphonique*, *La Chasse du Prince Arthur*, incidental music to *Pêcheurs d'Islande* and *Paysages de Brétagne*, some chamber music, organ works, pieces for piano, songs.

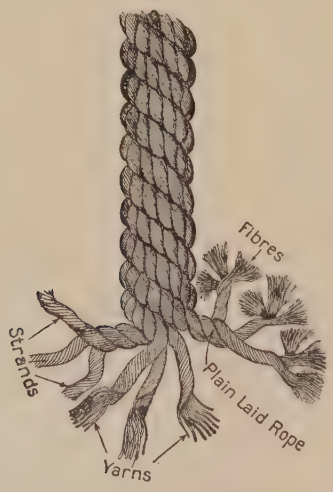
ROPE (AS. *rāp*, Goth. *raips*, OHG. *reif*, cord, Ger. *Reif*, ring; of uncertain etymology). Technically, cordage 1 inch or more in diameter. The term "cordage" is used in a collective sense to include all sizes and varieties of cords and rope from harvester twine to the largest cables. It is probable that ropemaking was among the earliest of industries. The materials first used for the purpose were probably the fibres of various plants, the inner bark of trees, and the hides of animals cut into thongs and twisted. Sculptural representations of ropemaking are found upon ancient Egyptian manuscripts, showing that they made use of flax and the fibres of the date tree as well as of rawhide. Herodotus states that the Persians manufactured cables 28 inches in circumference of flax and papyrus with which to aid in constructing the bridge of boats upon which the army of Xerxes crossed the Hellespont. Peruvians used fibres of the maguey for rope and twisted cables of sufficient strength to carry the primitive suspension bridges.

Prior to the year 1820 hand labor, aided only by the clumsy wheels and other imperfect contrivances pertaining to the old-fashioned ropewalk, was exclusively employed in the manufacture of rope. In that year some machines were constructed in England for twisting hand-spun yarn into strands, and a few were imported into the United States. Next came the introduction of machines for spinning the threads from raw material. The first ma-

chinery for this purpose was constructed in Massachusetts in 1834. American machines are now extensively employed in Europe, and American cordage is held in such high estimation that it is exported to all parts of the world.

Materials. The materials employed for ropemaking include hemp, flax, cotton, manila, sisal, jute, and other vegetable fibres. Russian hemp for tarred rigging has long maintained a reputation for superiority; its great strength and durability are attributed to the method of retting the fibre under water. Italian hemp is also excellent and for some uses unsurpassed. Manila hemp (see HEMP, MAÑILA) is perhaps more extensively used in the manufacture of cordage than any other material, as its great pliability and strength particularly adapt it for the running rigging of vessels and for a multiplicity of ordinary uses. Sisal, from Yucatan, and East Indian jute are largely used for the manufacture of the cheaper grades of cordage. See FLAX; HEMP; JUTE; SISAL.

Ropewalk Ropemaking. The old walk was usually from 1000 to 1400 feet long. Fibres of hemp were hackled or straightened out by drawing the material through a steel-toothed comb. The workman then wound a bundle of hemp about his body, attaching one end to one of a series of hooks on a whirl or looper, drawing out the fibres from the bundle with one hand and compressing them with the other, experience teaching the number of fibres to draw out and how to twist them so as to hold firmly to the hook. He then walked slowly backward down the walk, making his yarn as he went, the spinning being done by the wheel or whirl turned by an assistant, the spinner seeing that



A CABLE-LAID ROPE.

the fibres were equally supplied and joining the twisted parts at the ends. Two or more spinners might be going down the walk at the same time, and at the end two would join their yarns together, each then beginning a new yarn and returning on the walk to the end, where the second spinner again took his yarn off the whirl and joined it to the end of the first spinner's yarn, so that it continued on the reel. When a sufficient number of yarns were spun they were twisted into strands and the strands into ropes, horse power being usually employed.

The next improvement was the introduction of machines for twisting the yarn into strands and laying the strands into cables. The nature and operation of these machines can best be explained by describing a modern ropewalk plant, the reader taking care to remember, however, that at first hand-spun yarn was employed instead of the present machine-spun yarn. Most large rope, such as towing lines and ship cables, is walk-laid rope. The first operation is to wind the yarn on large bobbins. These bobbins are put on a framework of wood located near one end of the ropewalk, and the ends of the yarns from them are passed through holes in an iron gauge plate, known as the face plate, and then through a cast-iron tube, which acts to collect the separate yarns into a closely laid cylindrical bundle. After being passed through the tube the yarns are fastened on a hook of the forming machine, which runs on a track the entire length of the walk and which at the same time twists the yarns left-handed into a strand. To lay these strands into a rope two laying machines are required, one at each end of the walk, which are known as the upper and lower machines. As many of the strands as are required for the rope are stretched at full length along the walk and are attached to the hooks on the laying machines. The upper machine has but one hook, to which all the strands are attached and which operates in one direction, while the lower machine has as many hooks as there are strands and operates in the opposite direction. To keep the strands equidistant they are placed in the grooves of a conical wooden block called a top, which is attached to an upright post on a car called a top stud. The top is pushed up close to the upper laying machine at the beginning of the twisting process, and, as the twisting proceeds, the strands closing in behind it gradually force it down the walk until the lower laying machine is reached and the rope completed.

Machine Ropemaking. The greater part of medium-size rope is made by ropemaking machines, as distinguished from the ropewalk. In describing ropemaking by machines reference will be had particularly to the working of Manila hemp, the material most extensively used, but Russian, sisal, and other hemps are manipulated in essentially the same manner. The treatment of jute requires a rather different process, owing to its shorter and weaker fibre. The bales of Manila hemp, averaging in weight about 270 pounds each, are opened, and, after the fibre has been lightly shaken apart, it is placed in layers which are sprinkled lightly with oil to soften and to lubricate the fibre previous to its passage through the machines. The first mechanical operation is called scutching and consists in passing the hemp over revolving cylinders bristling with sharp steel prongs or teeth, which straighten out the fibres and remove the coir or fine broken particles, the dirt, and other foreign substances. It is then passed on to the breakers, which are large frames each about 25 feet long, consisting of two endless chains covered with long steel pins. The first chain feeds the fibres to the second, which runs much slower, the effect being to comb or straighten out the fibres and draw them into a continuous ribbon or sliver. Following this operation comes the passage of the hemp through the spreaders and drawing frames, machines similar to the breakers, but smaller, and furnished with steel pins and teeth of

gradually increasing fineness, which still further comb and straighten out the fibres—a number of slivers being put together behind each machine and drawn down to one sliver again at the end of each machine. This drawing is repeated several times through machines of various degrees of fineness, in order to make the sliver even, without which it would be impossible to spin fine even yarns. This process is completed on a very fine drawing frame called a finisher, and from this the material emerges in complete readiness for spinning. The spinning is done on spinning machines or jennies, each operating two spindles, moving at about 1500 revolutions per minute. The spinning twists the fibre right-handed into yarn, about 1000 yards of which are wound upon each bobbin. The next process is to form the yarn into strands and lay the strands into rope, and this is performed upon machines known as formers and layers. For the larger sizes of rope there are usually separate machines, but for rope ½ inch in diameter and less the former and layer are combined into a single machine. The former consists of a circular iron disk, at the centre of which is erected a perpendicular shaft, carrying at its end a head or die. The plane of the disk may be either horizontal or vertical. Around the edge of the disk are spaced several bobbins or spools full of yarn, the number of spools used depending upon the number of yarns in the final strand. The free end of the yarn from each spool is carried to the head, where, by a revolving motion of the disk, they are twisted together and wound off on to a spool or drum. If we substitute for the spools of yarn just described spools filled with twisted strands, we have in its essentials a layer. When former and layer are combined, each spool on the large disk is replaced by a small disk and head, which twists a strand, the several strands being led to the head of the main disk and there twisted into completed rope, which is wound off on to a drum or reel.

Special Ropes. Cables for drilling oil and water wells have to be made unusually long and run all the way from 1400 to 3500 feet in length and from 1⅞ to 2½ inches in diameter. They are composed of three strands of Manila ropes, laid together with a very hard lay, so that they will not untwist when used for drilling, and also will resist the continual wear and rubbing against the side of the casing and the wall of the well. Cables of this kind are always made on machines and not in the ropewalk. These machines have to be exceedingly large and heavy to carry this amount of rope, and only a few mills in the world are equipped for making well-drilling cables. For making tarred rope the yarns are first run through copper tanks filled with heated tar; the yarns enter through holes in an iron plate and are drawn through the tank by machinery. As the yarns emerge from the tank the superfluous tar is removed by means of pressing rollers. Tarred rope may be made any size by the methods already described, but a large proportion of tarred yarn is made into small cordage.

Strength of Rope. The strength of rope varies with the material of which it is made, the weight of the rope per fathom, etc. The following figures, compiled from Kent's *Mechanical Engineer's Pocket Book* (8th ed., New York, 1913), give some general information on this matter:

MATERIALS	Circ. in inches	Weight, lbs. per fathom	Strength, lbs.
Untarred hemp	1.53–6.9	0.42– 7.77	1,670–33,808
Tarred hemp...	1.44–7.12	0.38–10.39	1,046–31,549
Cotton rope....	2.48–6.51	1.08– 8.17	3,089–23,258
Manila rope ...	1.19–8.9	0.2 –11.4	1,280–65,550

The comparative strength of hemp, iron, and steel ropes is indicated in a general way by the following figures from Weisbach; girth required to give tensile strength of 40 tons—hemp, 12 inches; iron, 4⅝ inches; steel, 3¾ inches.

For a description of the manufacture of wire rope, see WIRE ROPE. For details of the strength and efficiency of rope and its application to transmission of power, consult J. J. Flather, *Rope Driving* (New York, 1897), and William Kent, *Mechanical Engineer's Pocket Book* (8th ed., ib., 1912).

ROPES, ARTHUR REED (1859–). An English author best known for his comic operas, written under the name of Adrian Ross. He was born in London, studied at King's College, Cambridge, and was Lightfoot and Whewell scholar in 1883 and fellow of King's from 1884 to 1890. He lectured on history at Cambridge and wrote a *Short History of Europe* (1889). He edited *Lady Mary Wortley Montagu's Letters* (1893) and numerous French texts for the *Pitt Press Series*. Ropes's first comic opera, *Faddimir*, was produced in 1889. His other productions include the lyrics and the libretti (in collaboration) for *Joan of Arc* (1891), *San Toy* (1899), *The Toreador* (1901), *Merry Widow* (1907), *The Dollar Princess* (1909), *Gipsy Love* (1912). In 1914 appeared *The Hole of the Pit*.

ROPES, JOHN CODMAN (1836–99). An American lawyer and military historian. He was born in St. Petersburg, Russia, where his father, a Boston merchant, lived for some time; graduated at Harvard in 1857 and at the Harvard Law School in 1861; and in the latter year was admitted to the Massachusetts bar. In 1865 he became associated in practice in Boston with John C. Gray, from 1866 to 1870 was one of the editors of the *American Law Review*, and from 1878 until his death was head of the law firm of Ropes, Gray & Loring. He founded in 1876, and until his death was the leading spirit in, the Military Historical Society of Massachusetts, which collected and sifted evidence regarding the Civil War. Of his works, which gained him an international reputation as a military historian, *The Army under Pope* (1881) greatly influenced popular sentiment, vindicating General Fitz John Porter; *The Campaign of Waterloo* (1892–93) is one of the ablest monographs on that subject; and *The Story of the Civil War* (2 vols., 1894–98), left unfinished, is a notable account of the military operations of 1861–62. Ropes published also *The First Napoleon* (1885).

ROPEWAY. A line of rope or steel cable in which a carriage with grooved wheels is supported and carries a load. This carriage, with its burden, may be moved either by power or by gravity, and the device is frequently employed in mining and other operations, especially for crossing valleys. Ropeways have been in use since the early part of the nineteenth century, but the idea is now more generally applied in the cableway (q.v.), where a load is

not only transported, but is hoisted from any point on the line and delivered at any other desired point. Telpherage (q.v.) is also a further adaptation of the same principle.

ROPS, rō, FÉLICIEN (1833–98). A Belgian etcher, painter, and lithographer of Hungarian descent. He was born at Namur, was educated at the university at Brussels, and his first drawings appeared in 1856 in the *Crocodile*, a student publication. A year afterward he founded *Uylenspigel*. About 1862 he went to Paris, where most of the remainder of his life was passed, and was employed mainly in illustrating, though he also painted in oil and water color. The cynicism and rare imagination of his drawings have made his name widely known, although the erotic subjects he usually chose displeased many. In spirit Rops is akin to Beaudelaire, whose poems he illustrated, and to Edgar Allan Poe, but while despising the conventional he possessed great respect for his art, and his works rank with the highest for breadth, power, and sheer technical skill. Among his most remarkable productions are the series of etchings known as the "Sataniques"; the "Album of 100 Sketches"; the water colors "The Temptation of St. Anthony" and "The Quarrel" (Brussels Gallery); his illustrations for Barbey d'Aurevilly's *Les diaboliques* and Peladan's *Le vice suprême;* and his lithographs "Interment in the Walloon Country" and "At the Trappist's." He executed about 600 etchings and 300 lithographs. Consult the monographs by Ramiro (Paris, 1905), Lemonnier (ib., 1908), and Mascha (with complete catalogue of his works, Munich, 1910).

ROQUE, rōk. The game, first under the name of croquet, has experienced many fluctuations. It was a favorite game at the courts of kings 200 years ago, yet by the end of the eighteenth century it had sunk into oblivion and, except in a remote portion of Ireland, had been unpracticed. From that country it was retransported across the Channel to England previous to 1860, and then the playing of the game became again so popular for 20 years as to assume the proportions of a national game. It traveled over the Atlantic, where it had become very popular by 1882; yet in both countries by 1894 it had been so entirely supplanted by lawn tennis that the English national association went out of existence, and in America only a few votaries remained. About 1900 it again came into vogue in England, while in America, under the name of roque, it has become a scientific and enthusiastically followed game.

It is played either on a court of grass or closely packed earth, on which a number of arches (from six to ten) have been placed upright in a defined order. Each player has a mallet and a ball. Two can play the game, but it is a better game when played by the maximum number allowed (eight), divided into pairs of partners, each playing alternately. The object is to get the ball through every arch or hoop in due order and to keep opponents from doing so by interference within the rules.

The English and American methods varied from the first. In England the championship round was through six hoops, arranged in a prescribed form; in America it was through 10 hoops, arranged in entirely different order. In England the championship court was rectangular; in America the corners of a court 36 by 72 feet were cut off. Then, too, the size of the balls and the width of the hoops varied. In England the hoops were at first 15 to 18 inches wide at the base; gradually they were reduced to 5½ inches and ultimately to 3⅝, leaving ⅛ of an inch margin on either side of the ball. Even this width of hoop was reduced to 3⅜ inches in America. In many other respects the American game has been made more difficult.

The few who restored croquet to popularity and made it a highly scientific game, with shorter and better mallets, specially prepared courts with rubber cushions, and more difficult

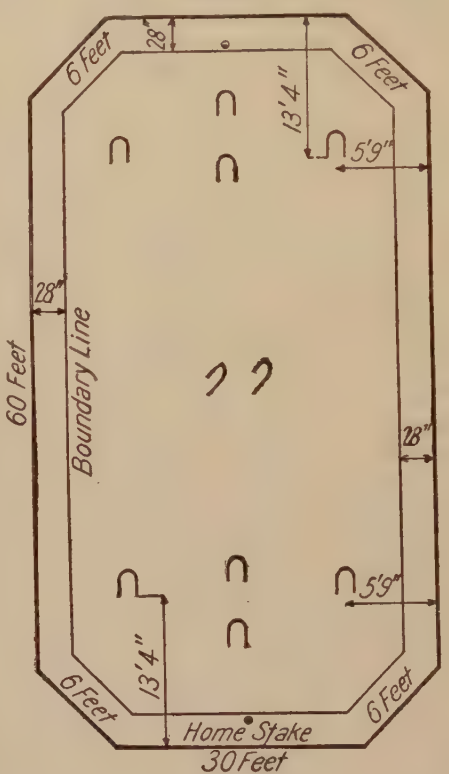


DIAGRAM OF ROQUE COURT.

hoops, played the eighteenth annual championship of the National Croquet Association, under the old name of croquet, in 1899, after which they adopted the new name of roque to mark the distinction between the two games.

The rules for the game of roque will be found in the *Official Roque Guide*, Group xi, No. 271, of Spalding's Athletic Library (New York, annually), from which the accompanying plan of the court is reproduced. See also Arthur Lillie (ed.), *Croquet Up to Date* (New York, 1900).

ROQUE, JEAN FRANÇOIS DE LA, SIEUR DE ROBERVAL. See ROBERVAL, J. F. DE LA ROQUE, SIEUR DE.

ROQUE, rôk, SAINT. See ROCH, SAINT.

ROQUEFORT, rōk'fôr'. A village in the Department of Aveyron, France, famous for its production of a cheese made from the milk of goats and sheep and matured in the rocky caves of the Larzac cliffs. Pop., 1901, 937; 1911, 1151.

ROQUETTE, rō'kĕt', OTTO (1824–96). A German poet of French descent, born in Kro-

toschin, Posen. He studied at Heidelberg and Halle and taught literature in the Darmstadt Polytechnic Institute from 1869 to his death. His first book was his greatest success, an allegoric tale in verse, *Waldmeisters Brautfahrt* (1851; 77th ed., 1905). Among his other poems, none of which approached the *Brautfahrt* in popularity, mention may be made of the *Liederbuch* (1852; 3d ed., 1880), which is in the Anacreontic manner; *Hans Haidekuckuck* (1885; 4th ed., 1894); and *Cesario* (1888), a volume of narrative verse. Besides several novels and dramas Roquette wrote a *Geschichte der deutschen Litteratur* (1862–63; rev. 1882). Consult the autobiography, *Siebzig Jahre* (Darmstadt, 1893).

RORAIMA, rō-rä'ē-mȧ, Mount. A remarkable mesa or flat-topped mountain block situated at the common boundary point of Venezuela, Brazil, and British Guiana (Map: Brazil, E 2). From a sloping talus at the base the perpendicular rocky walls rise to a sheer height of nearly 3000 feet, though a sloping ledge on one side enables an ascent to be made to the summit, which has an altitude of 8740 feet above the sea. Several streams rise on the summit and fall over the edges, forming the highest cascades in the world.

RO'RER, Sarah Tyson (1849–). An American pioneer in the field of domestic science. She was born at Richboro, Pa., was educated at the East Aurora (N. Y.) Academy, and became principal of the Philadelphia School of Domestic Science. In 1871 she was married to W. A. Rorer. She was editor and part owner of *Table Talk* from 1886 until 1892; was an editor of *Household News* from 1893 until 1897; then was a member of the staff of the *Ladies' Home Journal* until 1911, when *Good Housekeeping* secured her services. Mrs. Rorer published numerous books on cooking which became standard. She was a contributor to the New International Encyclopædia.

RO'RIC FIGURES (from Lat. *ros,* dew). Images produced by breathing on glass or other polished surfaces which have been covered by some object. Moser, of Königsberg, in 1842 discovered that when two bodies are in close proximity they receive impressions of each other's images, or, if a smooth surface has been touched by another body, it acquires a property of precipitating vapors which, by their action, cause an impression which gives to the surface a different appearance. These roric figures are called by the Germans *Hauchbilder,* or breath figures. Consult Müller-Pouillet, *Lehrbuch der Physik* (Brunswick, 1886), and O. D. Chwolson, *Lehrbuch der Physik,* vol. i (ed. by H. Pflaum, ib., 1902).

RORQUAL, rôr'kwal (from Norw. *rörhval,* dial. *röyrkval,* red whale; cf. Icel. *reyðarhvalr*). A whale of the family Balænopteridæ, which includes whalebone whales of large size, differing from the right whales in the comparatively small head, the presence of a dorsal fin, and the fact that the throat is deeply ridged and furrowed lengthwise. The baleen is short. Many species of rorqual are known in various oceans, including the largest of known whales, such as Sibbald's or the blue whale, which reaches a length of 85 feet, the finner, the humpback, and the California gray whale, all of which are elsewhere described. The northern rorqual or razorback (*Balænoptera musculus*) is a slate gray, whitish beneath. It is found in the Arctic seas. It is not easily captured, and whalers dislike it because the Greenland whale is seldom found near it, while its own value is inferior, owing to the comparative thinness of blubber and the shortness and inferior quality of whalebone. It is an important object of pursuit to the Laplanders and Greenlanders. This rorqual does not feed so exclusively on small prey as does the Greenland whale. Its gullet is wider, and it preys much on fishes, the shoals of which it follows into bays and estuaries. Consult authorities cited under Whale.

RO'RY O'MORE'. A novel by Samuel Lover (q.v.), published in 1836, and a ballad by the same author. See O'More, Rory.

ROSA, rō'zȧ, Carl (1842–89). A German violinist and impresario, born at Hamburg. He studied in the conservatories of Leipzig and Paris, was concertmeister at Hamburg (1863–65), and on a tour of the United States in 1867 married Euphrosyne Parepa, the famous soprano. Together they formed an opera company, with Madame Rosa as its prima donna, which gave a great number of successful performances both in the United States and in England. The Carl Rosa opera company was important principally for its creditable presentations of foreign operas in English.

ROSA, Edward Bennett (1861–1921). An American physicist, born at Rogersville, N. Y. He graduated at Wesleyan University in 1886 and at Johns Hopkins (Ph.D.) in 1891. He was professor of physics at Wesleyan from 1891 to 1902. He then became physicist, and in 1910 chief physicist, of the United States Bureau of Standards. Rosa was associated with Professor Atwater at Wesleyan in experiments on the conservation of human energy. His writings include: *The Specific Inductive Capacity of Electrolytes* (1892); *Descriptions of a New Respiratory Calorimeter* (1899), with Atwater; and many publications of the Bureau of Standards.

ROSA, Euphrosyne Parepa-. See Parepa-Rosa, Euphrosyne.

ROSA, Salvator (1615–73). An Italian painter, the chief master of the Neapolitan school; also an etcher, satirical poet, and musical composer. He was born near Naples, the son of an architect. He studied music and poetry before taking up painting under his uncle, Paolo Greco, and his brother-in-law, Fracanzano, a pupil of Ribera, whose school Salvator afterward also frequented. Before he was 18 he wandered about sketching in the mountainous regions and along the shores of south Italy, often falling in with the banditti, who appear so frequently in his pictures. Soon after his return to Naples the death of his father threw the support of the family upon his shoulders, and he painted small pictures at low prices until they attracted the attention of Lanfranco. He now also won the friendship of Falcone (q.v.), under whose instruction Salvator learned to paint battle scenes. In 1635 he went to Rome and found a patron in Cardinal Brancaccia, returning thence to Naples. The favorable reception of his "Prometheus" (Palazzo Corsini) at Rome induced him to repair once more (1639) to the Eternal City. In 1640 he accepted the invitation to the grand ducal court at Florence, where he spent nine years, enjoying with other friendships that of Lorenzo Lippi, in whose pictures Salvator painted the landscapes. The story of his participation in the insurrection of Masaniello at Naples in 1647

and of his joining Falcone's Compagnia della Morte deserves little credence beyond the fact that he sympathized with the movement and afterward painted Masaniello's portrait. In 1649 he returned to Rome and remained there until his death, March 15, 1673.

The great ambition of Salvator Rosa was to excel as an historical painter, and some of his pictures go far to justify his aspiration. But his chief power lay in painting landscapes, marine views, and battle scenes. His genius for landscapes was self-taught and original, preferring such subjects as the lonely haunts of wild beasts and robbers, rocky precipices and gloomy caves; his trees are shattered or torn up by the roots, and the atmosphere itself of a cheerless hue, only occasionally lighted up by a solitary sunbeam. In his later Florentine period the influence of Claude Lorrain seems traceable in a few summer harbor views, exemplified by the large and splendid "Coast Scene" in the Palazzo Colonna, Rome. Salvator also painted excellent portraits. He produced about 90 spirited etchings after his own designs. His satires, written in terza rima, are spirited and brilliant, but often lack literary form. The best of them are entitled *Music, Poetry, Painting, War, Babylon,* and *Envy.* He attacks bitterly the vices and foibles of all classes except the poor, whom he champions, along with morality and the Catholic faith. His poems were edited by Cesareo (Naples, 1892) and Cartelli (ib., 1899). Consult: Lady Morgan, *Life and Times of Salvator Rosa* (new ed., London, 1855), romantic and uncritical; Giosuè Carducci, "Vita di Rosa," in *Salvator Rosa: satire, odi e lettere* (Florence, 1860); C. A. Regnet, "Salvator Rosa," in Robert Dohme (ed.), *Künst und Künstler Italiens,* vol. iii (Leipzig, 1879); Leandro Ozzola, *Vita e opere di Salvator Rosa* (Strassburg, 1908), the best biography.

ROSA'CEA. See ACNE.

ROSA'CEÆ (Neo-Lat. nom. pl. of Lat. *rosaceus,* made of roses, from *rosa,* rose), or ROSE FAMILY. A family of about 75 genera and 1200 species of dicotyledonous herbs, shrubs, and trees, chiefly natives of the cooler parts of the Northern Hemisphere and among which are many species of great usefulness and beauty. It embraces the most important fruits of temperate climates, as the apple, pear, plum, peach, blackberry, raspberry, strawberry, and many ornamental plants such as rose, spiræa, mountain ash, etc. The fruit is various, as a drupe, pome, follicle, an achenium, a heap of achenia, or of one-seeded berries, etc.

The family is characterized by its regular flowers, numerous stamens inserted on the calyx, and (usually) several carpels. The conspicuous tribes, distinguished chiefly by their fruits, are as follows: (1) pome tribe, represented by the apple, pear, quince, haw, etc., in which the fruit (pome) is a fleshy calyx, the ovary being represented by the core; (2) drupe tribe, represented by the peach, apricot, plum, cherry, etc., in which the fruit (drupe) is a layer of the ovary wall, the inner layer forming the stone; (3) bramble tribe, represented by the blackberry and raspberry, in which the fruit is a group of small drupes investing the receptacle, which in the blackberry is also fleshy; (4) potentilla tribe, represented by the strawberry and a large number of well-known flowers, in which the fruit is a heap of achenes, which in the strawberry invest the fleshy receptacle; (5) rose tribe, in which the achenes are borne in a globular or urn-shaped calyx tube (hip). See ROSE; RUBUS; STRAWBERRY; AGRIMONY; SPIRÆA.

ROSALES, rō-sä'lās. A town of Luzon, Philippines, in the Province of Pangasinan, situated on the Agno River, 24 miles southeast of Lingayen. Pop., 1903, 8562.

ROSALIND, rōz'ä-lĭnd. In Shakespeare's *As You Like It,* the daughter of the banished Duke. She is herself banished and, assuming male attire, lives with a companion in the forest of Arden until Orlando meets her.

ROSAMOND. See FAIR ROSAMOND.

ROSAN'ILINE. See COAL-TAR COLORS.

ROSANOFF, rō-zä'nŏf, MARTIN ANDRÉ (1874–). An American chemist, born at Nikolaev, Russia, and educated at the classical Gymnasium of that city and later at New York University. From 1895 to 1898 he studied under Van't Hoff and Landolt in Berlin and under Friedel in Paris. Later he became research assistant to Crafts at the Massachusetts Institute of Technology and was on the staff of the NEW INTERNATIONAL ENCYCLOPÆDIA (1900–1903 and 1913–16) as chemical contributor and editor for the exact sciences. After serving for a year as chemical research assistant to Thomas A. Edison he became instructor and assistant professor at New York University and in 1907 was called to reëstablish and assume the directorship of the graduate department of chemistry in Clark University. In 1914 he became professor of chemical research in the University of Pittsburgh and in 1915 was elected the first life incumbent of the newly endowed Willard Gibbs chair of research in pure chemistry in the Mellon Institute (q.v.) and the graduate school of the university. His original contributions to chemistry, published in the *Zeitschrift für physikalische Chemie* and the *Journal of the American Chemical Society,* deal mostly with the mechanism and catalysis (q.v.) of organic reactions and with the partial vapor pressures and distillation (q.v.) of liquid mixtures. For his services in connection with the latter subject he received the Nichols gold medal of the American Chemical Society in 1910. He was made a fellow of the American Academy of Arts and Sciences and a member of the National Institute of Social Science.

ROSARIO, rō-sä'rē-ō. A city in the Province of Santa Fé, Argentina, situated on the west bank of the Paraná, 175 miles northwest of Buenos Aires and 214 miles above that city along the river (Map: Argentina, G 4). It is entered by five railroads, is substantially built, and has wide streets traversed by several lines of street railways. The chief importance of the city lies in its commerce. Considerable river traffic is carried on, Rosario being the principal port and outlet for the products of all the northern provinces of the Republic. The river is navigable to this point for vessels drawing 16 feet, and transatlantic steamers load directly at the wharves. There are grain elevators. The chief exports are wheat, hides and other agricultural and cattle products, metals, and ores. Its trade has increased rapidly; the exports were valued in 1913 at $87,857,417 and the imports at $35,997,341. Rosario is the second city in size in the Republic. It has grown up almost entirely during the last half century. Pop., 1895, 94,025; 1912 (est.), 180,000.

ROSARIO. A town of Luzon, Philippines, in

SALVATOR ROSA

A MARINE PAINTING IN THE PITTI GALLERY, FLORENCE

the Province of Batangas. It lies about 12 miles northeast of Batangas and is connected by highways with the larger places of the province. Pop., 1903, 8326. During the insurrection against the United States the town was destroyed by the insurgents.

ROSARY OF THE BLESSED VIRGIN MARY (ML. *rosarium*, garland of roses, chaplet of beads, neut. sing. of Lat. *rosarius*, relating to roses, from *rosa*, rose). The name given to a form of prayer in the Roman Catholic church. It has been traced either to the title Mystical Rose, one of the titles under which the Virgin is addressed in the litany (q.v.) of Loreto, or to St. Rosalia's wreath of roses, or to the beads being made commonly of rosewood. The origin of the devotion is popularly traced to St. Dominic, but it is quite certain that its characteristic feature, the use of beads for reckoning the number of repetitions of a prayer, is of greater antiquity. (See BEAD.) The same use of beads exists among the Mohammedans. Originally the prayer so repeated was the Lord's Prayer, but when in the eleventh and twelfth centuries the angelical salutation, "Hail Mary!" etc., became a frequent form of prayer, it was added to "Our Father," and it seems beyond all doubt that the rosary in its present form was fully introduced by St. Dominic. The repetition of these short and simple prayers is supposed to be accompanied by meditation on mysteries of the faith, of which 15 are named, though only five are usually taken up at one time. When recited publicly the prayers are repeated alternately by the person presiding at prayer and by the congregation. The first Sunday in October is the Feast of the Most Holy Rosary.

The mechanical instrument of this devotion is also called by the name "rosary." It consists of a string of beads, equal in number to the "Our Fathers" and "Hail Marys" recited in the rosary—the "Our Father" beads being of a larger size—one of which is passed through the fingers at each recitation of the prayer. The beads are blessed for the use of the people by the Pope, by bishops, and by others having special power for the purpose.

ROSAS, rō'sȧs, JUAN MANUEL (1793–1877). Dictator of the Argentine Confederation, born at Buenos Aires. He entered the army, identified himself with the Federalist party, and in 1829 rose to be Governor or Captain General of his native state. In 1832 he resigned to conduct the war against the Indians and was succeeded by Balcarce. In 1835 Rosas made himself dictator of the Argentine Confederation. He carried on relentless war against the chiefs of the party of the Unitarios, who favored a strongly centralized government, and did not hesitate to employ the weapons of torture and assassination. His sanguinary measures, however, gave the country peace. The other states became jealous of the power of Buenos Aires, and Rosas was justly accused of a design to extend and uphold the undue predominance of his state and to give his native city a monopoly of the trade of the river Plate. To extend his influence over Uruguay he took up arms in behalf of Oribe (q.v.) and besieged Montevideo for a long period (1842–51). England and France interfered and in 1845 captured the Argentine fleet, yet Rosas succeeded in 1849 in obtaining a favorable peace. Finally Urquiza, Governor of Entre Ríos, marched against him. Rosas's forces were put to flight, and he fled to England, where he died. Consult J. M. Ramos Mejia, *Rosas y su tiempo* (2 vols., Buenos Aires, 1907).

ROS'CELI'NUS, ROUSSELIN, rōōs'lăn', or **RUCELIN,** JEAN (c.1050–?). A French philosopher, the leading exponent of nominalism. It is probable that he was born in Brittany and educated at Soissons and Rheims. He became canon at Compiègne, where he enunciated the doctrine that abstracts and universals are nonexistent, being mere terms or names. In 1092 he was tried at Soissons and forced to recant after a discussion with Anselm. He lived for some time in England, then returned to France, became the teacher of Abélard, and charged his pupil with heresy when he declared strongly for the orthodox views. Consult F. J. Picavet, *Roscelin, philosophe et théologien* (Paris, 1911), containing a bibliography, and the histories of philosophy.

ROSCHER, rō'shĕr, WILHELM (1817–94). A German economist, founder of the historical method in political economy. He was born in Hanover, studied in Göttingen and Berlin, became professor in the former university in 1844, and in 1848 was called to a chair at Leipzig. His *magnum opus* was a *System der Volkswirtschaft* in five volumes (1854–94), of which the first, which went through 21 editions during Roscher's life, was translated into English by Lalor (1878) as *Science of Political Economy Historically Treated.* The other volumes deal with agriculture and forestry, trade and commerce, finance, and charities. This great treatise was supplemented by the *Geschichte der Nationalökonomik in Deutschland* (1874) and by the monograph *Zur Geschichte der englischen Volkswirtschaftslehre* (1851–52). Roscher's other writings include: *Ueber Kornhandel und Teuerungspolitik* (3d ed., 1852); *Kolonien, Kolonial-politik, und Auswanderung* (3d ed., 1885); *Ansichten der Volkswirtschaft aus dem geschichtlichen Standpunkt* (1861; 3d ed., 1878); *Politik* (1892); *Geistliche Gedanken eines Nationalökonomen* (1894), posthumously published.

ROSCHER, WILHELM HEINRICH (1845–). A German mythologist, son of the economist Wilhelm Roscher. He was born in Göttingen, studied there and at Leipzig, and taught in the Gymnasium at Wurzen, where he was rector from 1893 to 1905. He became one of the foremost authorities on Greek and Roman mythology. His writings include: *Studien zur vergleichenden Mythologie der Griechen und Römer* (*Apollon und Mars*, 1873; *Juno und Hera*, 1875); *Das Naturgefühl der Griechen und Römer* (1875); *Hermes der Windgott* (1878); *Die Gorgonen und Verwandtes* (1879); *Selene und Verwandtes* (1890, 1895); *Ephialtes* (1900); *Die Sieben-und-Neunzahl im Kultus und Mythus der Griechen* (1904); *Die Zahl 40 im Glauben, Brauch, und Schrifttum der Semiten* (1908); etc. Even more important is the *Ausführliches Lexikon der griechischen und römischen Mythologie* (1884 et seq.), consisting of authoritative articles by Roscher and various other scholars, under his editorial charge; vol. iv was in progress in 1915.

ROSCIAD, rŏsh'ĭ-ăd (from Lat. *Roscius*, name of a famous Roman comedian), THE. A satire in verse by Charles Churchill (1761) on the London actors of that day.

ROS'CIUS, QUINTUS (?–62 B.C.). The greatest comedian in ancient Rome, born at Solonium,

near Lanuvium. Many aristocrats befriended him. Among his patrons Roscius numbered also Cicero, who received lessons in elocution from him. Roscius looked upon his art as one of no small importance and dignity and wrote a treatise on the comparative methods and merits of eloquence and acting. Cicero defended him in a lawsuit in his extant oration *Pro Q. Roscio Comœdo.*

ROS'COE, Sir Henry Enfield (1833–1915). An English chemist, grandson of William Roscoe, the historian. He studied at the University of London and at Heidelberg, was professor of chemistry in Owens College, Manchester, from 1857 to 1887, and became fellow of the Royal Society in 1863. He was one of the first to make exact measurements of the chemical action of light; for this and other scientific achievement he received in 1873 the Royal medal of the Royal Society. In 1883 he was knighted. From 1885 to 1895 he sat in Parliament as a Liberal. From 1896 to 1902 he was vice chancellor of the University of London. Dr. Roscoe's published works include a textbook entitled *Lessons in Elementary Chemistry* (1868), which passed through many editions and was translated into several foreign languages; *Lectures on Spectrum Analysis* (1870; 4th ed., 1885); *John Dalton and the Rise of Modern Chemistry* (1895); *New View of the Origin of Dalton's Atomic Theory* (1896), with Harden. Jointly with Schorlemmer (q.v.) he published an exhaustive *Treatise on Chemistry* (1877–98; 5th ed., rev., 1913). The best known among his numerous original contributions to science are those on photochemistry and those on the metal vanadium. Consult his own *Life and Experiences* (New York, 1906).

ROSCOE, William (1753–1831). An English historian, born in Liverpool. In 1774 he began the practice of law, meanwhile studying the classics and the Italian language and literature. In 1777 he published a collection of his verse, containing the first protest against the slave trade, of which, throughout his life, he was a strenuous opponent. In 1796 was published the first volume of his *Life of Lorenzo de' Medici, Called the Magnificent.* This work proved very popular and was translated into German, French, and Italian. In 1805 appeared his *Life and Pontificate* of Leo X, which was received with much commendation, though, especially with reference to the Reformation, severely criticized. During the later years of his life he devoted himself much to botany. Consult Henry Roscoe, *Life of William Roscoe* (2 vols., London, 1833).

ROSCOM'MON. An inland county of Connaught, Ireland (Map: Ireland, C 4). Area, 949 square miles. The surface, which belongs to the central plains of Ireland, is level, with undulations rising in the south and on the north. The principal rivers are the Shannon (q.v.) and the Suck. The soil is fertile in the central district, which is known as the plain of Boyle and which is celebrated for its sheep. Some portions produce good cereal crops, but the chief industry is sheep and cattle. Pop., 1901, 101,640; 1911, 93,904. The capital is Roscommon; pop., 1901, 1891; 1911, 1858.

ROSCOMMON, Wentworth Dillon, fourth Earl of (c.1633–85). An Irish poet, nephew of the Earl of Strafford. After the impeachment of his uncle he was sent to Caen, Normandy, where he was educated at the Protestant university. After the Restoration he held various court positions, married a daughter of the Earl of Burlington, and devoted himself to literature. His works, commended by Johnson and praised by Pope as the only pure writings of a dissolute reign, include an *Essay on Translated Verse* (1660); *Horace's Art of Poetry Translated into English Blank Verse* (1684); paraphrases of various psalms; a translation of *Dies Iræ;* and a collection of prologues and epilogues to plays.

ROSE (AS. *rōse,* from Lat. *rosa,* Gk. *ῥόδον, rhodon,* rose), *Rosa.* The popular name for a genus of plants of the family Rosaceæ, consisting of more or less erect climbing or trailing woody shrubs with odd-pinnate leaves. The flowers, borne solitary or in corymbs, are generally rose-colored. In its natural state and in single garden varieties the rose has five petals. The species, of which there are about 180, or according to some botanists only 30 or 40, are in some cases not well distinguished from varieties. Roses are natives of all the temperate parts of the Northern Hemisphere and thrive even in some of the colder regions. They have long been among the chief favorites in flower gardens. Countless single and double flowered varieties have been produced by cultivation by crossing and variation. These may be divided into two large classes—summer roses, or those blooming but once each year, usually in early summer, and perpetual or autumnal roses, which bloom more than once during the same season, many of them producing flowers continuously from early summer until late in the fall.

The summer roses include the Provence, damask and French, alba, Ayrshire, brier, multiflora, evergreen, and pompon garden groups. The Provence group consists of large-flowered varieties with a branching or pendulous growth and wrinkled leaf and includes the moss, pompon, and sulphurea forms. The damask and French group presents firm and robust growing plants producing large flowers and downy leaves. This group includes the hybrid French, hybrid Provence, hybrid Bourbon, and hybrid China roses. The varieties of the alba group are large-flowered, have a free growth, and are spineless. The leaf is characterized by a whitish upper surface. The other groups of summer roses have small-flowered double or single blossoms. The Ayrshires are climbing varieties producing their flowers singly. The briers generally have a short-jointed growth and include the Austrian, Scotch, sweet, and Penzance briers and the prairie and the Alpine roses. The multiflora group has a climbing growth and produces its flowers in clusters. This group includes some of the polyantha varieties. The evergreen group, including the sempervirens, Wichuraiana, Cherokee, and Banksian roses, is distinguished by its more or less shiny and persistent foliage. The pompons, as the name indicates, are of a dwarf growth.

In the summer and autumn flowering class the large-flowered groups comprise the hybrid perpetual, hybrid tea, moss, Bourbon, Bourbon perpetual, and China roses. All except the China group, which includes the tea and Lawrenceana varieties, have rough foliage. The small-flowered groups in this class include the musk, Ayrshire, polyantha, perpetual brier, and evergreen roses. The musk rose group, to which the noisettes belong, and the Ayrshire and polyantha groups have deciduous foliage and climbing habit. The

ROSES

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1 MARÉCHAL NIEL
2 MME DE WATTVILLE
3 PRINCESSE DE SAGAN
4 MUSK ROSE
5 LA FRANCE

perpetual briers, including the rugosa, lucida, microphylla, berberidifolia, and Scotch roses, are dwarf and bushy. The evergreen group in this class comprises the Macartney and Wichuraiana forms, in which the foliage is more or less persistent. The rose succeeds in warm, sunny, protected spots in most soils, but a friable, well-manured deep soil with a permeable subsoil is best adapted to the production of vigorous plants. Hybrid perpetuals prefer a strong, rich clay or loam, while tea roses are often grown in gravelly and sandy soil. Good drainage is always necessary. Roses are propagated from seeds, buds, layers, cuttings, and grafts. New varieties are grown from seeds. The most common method of propagation is by cuttings from nearly mature shoots which are started in sand under glass with low bottom heat. In budding the cultivated varieties are budded on manetti and multiflora stocks which are specially grown for this purpose in Europe. For grafting the stock used is *Rosa watsoniana*, a Japanese species. Pruning in rose culture is practiced for the purpose of removing the dead wood, giving the plant a symmetrical form and encouraging the development of flower buds.

Rose growing under glass has become a very important industry. The three-quarter span rose house extending from east to west with the long span to the south is most in use. A moderately stiff loam taken from an old pasture, well rotted and pulverized and mixed with about one-fourth its bulk of well-decomposed cow manure, makes a good soil for indoor rose culture. The benches should be 4 inches deep and well drained. The plants are generally kept in position by being tied to supports. The surface of the soil is very lightly stirred to kill all sprouting weed and grass seeds. Sometimes a light mulch of three or four parts of well-rotted cow manure and one part of soil is applied in August and again in January. During hot weather the temperature of the house is lowered by syringing several times a day and by the use of the ventilating arrangements. Ventilation is very beneficial and should be given whenever the weather permits. Propagation by cuttings is readily accomplished in rose houses because the conditions are all

SWAMP ROSE (*Rosa carolina*).

under control. Various varieties seem to require slightly different treatment, especially with respect to temperature. Such differences make necessary the separation of certain varieties. More than 100,000,000 cut roses are sold annually in the United States.

The influence of climate on rose culture is apparently greater than the influence of soil. A mild sunny climate is most favorable. The pleasant climatic conditions of Cannes and the Riviera in Europe and of southern California have made rose culture in those regions famous.

In landscape gardening the rose has a narrow range of application, since few species and varieties retain their foliage well enough to be valuable in picture composition. The free-growing unsupported bushy forms are, however, often trained as pillars and the climbing sorts over trellises, walls, arches, arbors, etc. But it is as a cut flower that the rose is eminent; it is far more useful for personal adornment and house decoration than either massed or separately in the garden.

Rose Diseases. Among the diseases occurring on roses grown outdoors are: leaf blight (*Actinonema rosæ*), which produces black enlarging spots upon the upper surfaces of the leaves, which turn yellow and fall; leaf spot (*Cercospora rosæcola*), which forms dark-red or nearly black spots with distinct grayish-brown centres as they grow older; mildew (*Sphærotheca pannosa*), which checks the growth of the young shoots and dwarfs the leaves, while a white powdery growth covers the leaves and stunts the plants; rust (*Phragmidium subcorticium*), which attacks all the green parts of the plant, causing reddish or yellow spots which increase in size until the leaves fall off; and crown gall, due to *Bacterium tumefaciens*. This trouble may be recognized by the swellings on the stems and larger roots. All diseased parts should be collected and burned, and the plants well sprayed throughout the season with a clear fungicide (q.v.). Of these diseases, leaf blight and mildew occur in greenhouses and may be treated with powdered or evaporated (not burned) sulphur. For crown gall in the greenhouse and probably outdoors the best method of treatment is the removal and destruction of the plants, thus preventing further spread of the trouble. See ROSE INSECTS.

Bibliography. J. H. Pemberton, *Roses: Their History, Development, and Cultivation* (New York, 1908); L. H. Bailey, *Cyclopedia of American Horticulture* (new ed., 4 vols., ib., 1909); H. H. Thomas, *The Rose Book* (ib., 1914); G. C. Thomas, Jr., *The Practical Book of Outdoor Rosegrowing for the Home Garden* (Philadelphia, 1914); T. W. Sanders, *Roses and their Cultivation* (London, 1914); also, Charles Joret, *La Rose dans l'antiquité et au moyen âge: Histoire, legende, et symbolisme* (Paris, 1892).

ROSE, CHAUNCEY (1794–1877). An American philanthropist, born in Wethersfield, Conn. He removed to the West in 1817 and settled in Terre Haute, Ind. He was active in promoting many industrial enterprises, chief among which was the building of the Indianapolis and Terre Haute Railroad. Having come into possession of his brother's estate, of the value of about $1,600,000, he carried out his brother's wishes, expressed in a defective will, by devoting the money to philanthropic enterprises. His chief benefaction was made to the Rose Polytechnic Institute (q.v.) at Terre Haute, Ind., which he organized in 1874.

ROSE, CHRISTMAS. See HELLEBORE.

ROSE, GEORGE (1817–82). An English humorist who wrote frequently under the pseudonym Arthur Sketchley. Born in London,

after receiving his degree from Magdalen College, Oxford, in 1848, he took orders in the Anglican church. In 1855 he went over to the Church of Rome. From 1858 to 1863 he was tutor to the Duke of Norfolk. Turning to literature he produced several light comedies, which met with success. He became widely known for numerous monologues on current topics purporting to be the views of Mrs. Brown, an illiterate old woman. They bore titles such as "Mrs. Brown's Visit to the Paris Exposition" (1867), "Mrs. Brown on the Alabama Claims" (1872), and "Mrs. Brown on Home Rule" (1881). They were published in *Routledge's Annual* (1866) and *Fun*. Rose traveled round the world, reading from these monologues. As a result of a visit to the United States (1867) he published the next year *The Great Country*. He also wrote two novels, *A Match in the Dark* (1878) and *A Marriage of Conscience* (1879). Consult William Winter, *Old Friends* (New York, 1909).

ROSE, rō'ze, GUSTAV (1798–1873). A German mineralogist, born in Berlin. He was a brother of Heinrich Rose and, like him, studied in Berlin and under Berzelius in Stockholm. He was appointed curator of minerals in the museum of Berlin University in 1822, lecturer in 1826, professor in 1839, and director of the Mineralogical Museum in 1856. He attempted to show a close relationship between electrical polarity and crystal form and therefore urged that the formation of crystals was in no way causally connected with physical surroundings. This system is set forth in his *Krystallochemisches Mineralsystem* (1852). His other works include: *Elemente der Kristallographie* (1833; continued by Sadebeck and Websky); *Beschreibung und Einteilung der Meteoriten* (1864); *Ueber die Kristallisation der Diamanten* (1876).

ROSE, HEINRICH (1795–1864). A German chemist. He was born in Berlin. He studied chemistry in Berlin, in Stockholm under Berzelius, and in Kiel, and became lecturer in Berlin in 1822 and professor in 1835. He devoted himself to analytical chemistry and may be considered one of its founders. He made especial study of the rarer elements, was first to isolate many substances, and in 1844 discovered the metallic element niobium or columbium. Rose made valuable contributions to Poggendorff's *Annalen* and wrote *Ausführliches Handbuch der analytischen Chemie* (1851 and after), a standard work. Consult the biography by Rammelsberg (Berlin, 1866).

ROSE, HUGH HENRY, BARON STRATHNAIRN. See STRATHNAIRN.

ROSE, HUGH JAMES (1795–1838). A Church of England theologian and one of the founders of the Tractarian movement. He was born at Little Horsted; educated at Trinity College, Cambridge; ordained deacon in 1818 and priest a year later; became curate of Buxsted, Sussex, in 1818 and of Horsham, Sussex, in 1821; prebendary of Chichester in 1827–33; rector of Hadleigh, Suffolk, in 1830 and of Fairstead and Werley in 1833, leaving the last for St. Thomas, Southwark, in 1837. In 1833 he was made professor of divinity in the University of Dublin, but ill health compelled his resignation the next year; in 1836 he became principal of King's College, London, but again ill health shortened his service, and he left England in October and died in Florence. He published *Christianity Always Progressive* (1829), *Notices of the Mosaic Law* (1831), *The Gospel an Abiding System* (1832) and founded the *British Magazine* in 1832. His memory survives from his association with the leaders of the Oxford movement (q.v.) in its earlier stages. The conference in which the movement took shape was held in his rectory at Hadleigh. Consult his biography in J. W. Burgon, *Lives of Twelve Good Men* (London, 1888).

ROSE, SIR JOHN (1820–88). A Canadian statesman, born at Turriff in Aberdeenshire, Scotland. He was educated in King's College, Aberdeen, and in 1836 emigrated to Lower Canada. In 1842 he was admitted to the bar in Montreal. In 1864 he was commissioner on behalf of Great Britain for the settlement of claims arising out of the Oregon treaty with the United States. Three years later he was returned to the Dominion Parliament and was Minister of Finance in 1867–69, when he removed to England. In 1870 he was sent by the British government to Washington on a mission relative to the Alabama claims. His efforts resulted in an informal convention, out of which grew the Treaty of Washington. He was created Baronet in 1872 and in 1886 became Imperial Privy Councilor.

ROSE, JOHN HOLLAND (1855–). An English historian, born at Bedford. He studied at Owens College, Manchester, and at Christ's College, Cambridge, where he graduated (B.A.) in 1879. He became lecturer on modern history to the Cambridge and London Societies for University Extension and after 1911 was reader in modern history at Cambridge, which university gave him the degree of Litt.D. His publications include: *The Revolutionary and Napoleonic Era* (1894); *The Reign of Queen Victoria* (1897); *The Rise of Democracy* (1897); *Life of Napoleon I, Including New Materials from the British Official Records* (1902); *Napoleonic Studies* (1904); *Despatches Relating to the Third Coalition* (1904); *William Pitt and the Great War* (1911); *The Personality of Napoleon* (1912); *Origins of the War* (1914); *The Development of the European Nations, 1870–1914* (1915). He also contributed to the *Cambridge Modern History*.

ROSE, JOSEPH NELSON (1862–). An American botanist. He was born near Liberty, Ind., and in 1885 graduated from Wabash College, where he was an assistant in botany in 1888–89. In 1888–94 he was connected with the division of botany of the United States Department of Agriculture; he served as assistant curator of the botany department (1894–1905) and associate curator (1905–12) of the United States National Museum; and thereafter was an associate in botany in the Museum and a research associate at the Carnegie Institution, Washington. Rose made botanical trips to South America in 1914 and 1915. His publications include: *Revision of the Umbelliferæ of the United States* (1888), with J. M. Coulter; *Useful Plants of Mexico* (1899); *Monograph of North American Umbelliferæ* (1901); *Revision of North American Crassulaceæ* (1905), with N. L. Britton; and papers on the cacti.

ROSE, ORDER OF THE. A Brazilian civil and military order of merit with six classes, founded in 1829 by Dom Pedro II. The medallion on the six-armed cross of white enamel bears the initials P. A. with the inscription *Amor e Fidelidade;* on the reverse are the date of foundation and the names Pedro-Amelia, in reference to Pedro's

marriage with Princess Amalie of Leuchtenberg. The ribbon is pink with two white stripes.

ROSE, William Stewart (1775–1843). An English poet and translator. He was educated at Eton, obtained a seat in Parliament (1796) and the position of reading clerk of the House of Lords (1800). Under the influence of the Romantic revival he published a verse translation of the first three books of *Amadis of Gaul* (1803), from Herberay's French version. The same year he made the acquaintance of Sir Walter Scott, who addressed to him the first canto of *Marmion*. In 1807 appeared his translation from the French of *Partenopex of Blois*. In 1817 Rose settled in Venice, where he began his well-known translation of Ariosto's *Orlando furioso* (1823–31; reissued in Bohn's Library, 1858). His last publication was a volume of *Rhymes* (1837).

ROSE BAY. See Oleander; Rhododendron.

ROSE BENGALE. See Coal-Tar Colors.

ROSE'BERY, Archibald Philip Primrose, fifth Earl of (1847–). An English statesman. He was born in London, May 7, 1847, and was educated at Eton and at Christ Church, Oxford. He left college in 1868 before graduating and took his seat in the House of Lords, having succeeded to the Earldom of Rosebery on the death of his grandfather, Archibald John Primrose. In Parliament he allied himself at once with the Liberal party and became an ardent supporter of Gladstone. In 1878 his marriage to Hannah Rothschild, daughter of Baron Rothschild, brought him powerful and influential friends in the financial world. In the same year he was made lord rector of Aberdeen University, and in 1880 he was chosen lord rector of the University of Edinburgh. In August, 1881, he accepted his first official appointment, that of Undersecretary of State for Home Affairs under Sir William Vernon Harcourt. His identification with the Gladstone administration terminated in 1883, however, when he resigned as a result of the hostile criticism of some members of his party who objected to a peer holding such an office. Towards the end of 1884 he accepted the post of First Commissioner of Works, with a seat in the cabinet. He left office with his colleagues in June, 1885. In the short-lived ministry of Gladstone, which began in February, 1886, he held the office of Secretary of State for Foreign Affairs and exhibited in the administration of that department unusual ability and skill. The years spent out of office succeeding the fall of the Gladstone ministry Lord Rosebery spent in travel and study, adding greatly to his reputation as an orator and political leader. In 1889 he was elected a member and the first chairman of the London County Council, holding office until June, 1890, and again for a few months in 1892. During a retirement in 1891, following the death of Lady Rosebery, he completed his *Life of William Pitt*, in the "Twelve English Statesmen Series." Upon the return of Gladstone to power in August, 1892, Lord Rosebery again became Foreign Secretary. The principal features of his foreign policy were his insistence on British control in the upper Nile valley and Uganda and his advocacy of the friendly policy subsequently adopted by Lord Salisbury in regard to the growth of the Japanese power in the Far East. In March, 1894, on the retirement of Gladstone, Lord Rosebery became Prime Minister. His personal popularity, however, did not avail to maintain his ministry, and on June 24, 1895, the government was defeated. On Oct. 8, 1896, Lord Rosebery, finding himself opposed to the foreign policy generally adopted by Gladstone and other former leaders of the party, formally resigned his leadership. In the succeeding years he adopted the policy of "plowing his furrow alone," as he phrased it, holding aloof from Liberal politics. He supported Salisbury in the Fashoda incident and the prosecution of the war in South Africa, although as the war progressed he bitterly criticized its conduct and urged the necessity of radical army reform. In addition to his *William Pitt* his principal writings are: *Speeches, 1874–96* (1896); *Sir Robert Peel* (1899); *Napoleon: The Last Phase* (1900); *Questions of Empire* (1900); *Lord Randolph Churchill* (1906); *Chatham* (1910). Consult: T. F. G. Coates, *Lord Rosebery: His Life and Speeches* (2 vols., New York, 1901); Justin McCarthy, *British Political Portraits* (ib., 1903).

ROSEBRUGH, rōze'brōō', Abner Mulholland (1835–1914). A Canadian physician and inventor. He was born near Galt, Ontario, educated at Victoria University and in New York and London, and practiced his profession in Toronto. He organized the Toronto Eye and Ear Infirmary in 1867 and afterward specialized in medical electricity and in ophthalmology. Among his inventions were a new demonstrating ophthalmoscope in 1864, a method of duplexing metallic circuit telephone lines in 1883, and an improvement upon this method in 1890 by employing doubly wound retardation coils. He also photographed in 1865 the inverted retinal image of an object played in front of the living eye. Besides his professional activity Rosebrugh was prominent in prison reform and other philanthropic work.

ROSEBURG, rōz'bûrg. A city and the county seat of Douglas Co., Oreg., 198 miles south of Portland, on the Umpqua River and on the Southern Pacific Railroad (Map: Oregon, B 4). It is situated in a picturesque mountainous and wooded region and contains the Oregon Soldiers Home. In the vicinity are many old Indian battle fields. A large trade is carried on in dried prunes, turkeys, fruits, timber, live stock, and dairy products. Pop., 1900, 1690; 1910, 4738.

ROSE COLD. See Hay Fever.

ROSECRANS, rō'ze-krănz, William Starke (1819–98). A distinguished American general, born at Kingston, Ohio. He graduated at West Point in 1842, entered the United States Engineer Corps, and served for a year as assistant to Colonel De Russey at Fortress Monroe. He then returned to West Point, where he served until 1847 as an assistant professor. In 1854 he resigned from the army and settled in Cincinnati, where he engaged in business as an architect and civil engineer. Upon the outbreak of the Civil War he was appointed colonel of the Twenty-third Ohio and in June, 1861, became a brigadier-general in the regular army. He took part in General McClellan's West Virginia campaign as commander of a brigade of Ohio and Indiana troops and on July 12, 1861, won the battle of Rich Mountain. Shortly afterward, when General McClellan was summoned to Washington, Rosecrans was put in command of the Federal forces in western Virginia. With them, on September 10, he routed General Floyd at Carnifex Ferry, thus clearing the Kanawha valley of the Confederates. In the following

year he commanded the right wing of the Army of the Mississippi in the advance on Corinth, fought the battle of Iuka, Sept. 19, 1862, and in October successfully defended Corinth against Generals Van Dorn and Price. On the twenty-sixth of the same month he relieved General Buell as commander of the Army of the Cumberland. He advanced upon Nashville and on December 31 and January 2 forced General Bragg to retire in the battle of Murfreesboro, or Stone River. In the following June he moved into east Tennessee and on September 19 and 20 was defeated by Bragg in the battle of Chickamauga (q.v.). The Federal army then fell back to Chattanooga, where it was besieged until relieved by General Grant. On October 23 Rosecrans was succeeded by Thomas, and after a short period of service in charge of the Department of Missouri he was relieved of all command. Concerning his military ability there has been much controversy. The weight of opinion, however, inclines to the view that "notwithstanding some faults of temper and military vacillation, General Rosecrans was undoubtedly a splendid fighter and a good strategist." Up to the time of the unfortunate battle of Chickamauga he had been uniformly and even brilliantly successful. At the close of the war he resigned from the army; in 1868 he served as Minister to Mexico and from 1869 until 1881 devoted himself to railroad and industrial enterprises, mainly in Mexico. He was elected to Congress in 1880 and again in 1882, as a Democrat, and served as chairman of the Committee on Military Affairs. From 1885 to 1893 he was Register of the United States Treasury. In 1889 Congress passed an Act restoring him to the rank and pay of a brigadier general. Consult: W. D. Bickham, *Rosecrans' Campaign with the Fourteenth Army Corps* (Cincinnati, 1863); T. B. Van Horne, *History of the Army of the Cumberland* (ib., 1875); H. M. Cist, *Army of the Cumberland* (New York, 1882); Johnson and Buel (eds.), *Battles and Leaders of the Civil War* (ib., 1887); John Fiske, *The Mississippi Valley in the Civil War* (Boston, 1900).

ROSE'DALE. A city in Wyandotte Co., Kans., adjoining Kansas City, Kans., on the north and Kansas City, Mo., on the east, on the St. Louis and San Francisco Railroad (Map: Kansas City, C 6). It is practically a part of the greater Kansas City. Pop., 1900, 3270; 1910, 5960.

ROSE FAMILY. See ROSACEÆ.

ROSEFISH, or REDFISH. A red scorpænid fish (*Sebastes marinus*), abundant on both coasts of the North Atlantic and far into polar latitudes, where it becomes a shore and surface fish, while south of Newfoundland it is found only offshore and in deep water. In Greenland, Labrador, Iceland, and Scandinavia it is an important food fish. In Nova Scotia it is called John Dory; among various other names are snapper and hemdurgan. This fish is about 18 inches long and orange red in color, with a few dusky bars across the back. Consult G. B. Goode, *Fishery Industries*, sec. i (Washington, 1884). See Plate of ROCKFISH, SUNFISH, ETC.

ROSE GARNET. See GARNET.

ROSEGGER, rō'zĕg-ĕr, PETER (1843–1918). An Austrian author. The son of poor peasants, he was born at Alpel, near Krieglach, in Styria. At 18 he was apprenticed to a tailor, but the patrons gained by his verses made it possible for him to give himself to literature. *Zither und Hackbrett* (1870), poems in Styrian dialect, were well received and were followed by prose tales and sketches in dialect and in literary German. In both prose and poetry he writes best of the Styrian peasant. Many of his books went through an immense number of editions. Among them are: *Volksleben in Steiermark* (1870); *Waldheimat* (1873); *Die Schriften des Waldschulmeisters* (1875); *Der Gottsucher* (1883); *Martin der Mann* (1891); *Peter Mayr* (1893); *Das ewige Licht* (1897); *Erdsegen* (1900); *Sonnenschein* (1902); *Weltgift* (1903); *Sünderglöckel* (1904); *Wildlinge* (1906); *Nixnutzig Volk* (1907); *Försterbuben* (1908); *Alpensommer* (1909); *Die beiden Hänse* (1912); *Heimgärtners Tagebuch* (1913). In English are to be had: *Selections from Waldheimat* (1895); *The God Seeker* (1901); *The Forest Schoolmaster* (1901); *The Earth and the Fulness Thereof* (1902); *I. N. R. I.: A Prisoner's Story of the Cross* (1905). A popular edition of his *Schriften* was published in three series and 40 volumes. Consult the autobiographic *Mein Weltleben* (Leipzig, 1898; new ed., supplemented, ib., 1914).

ROSE INSECTS. The rose is eaten by many insects wherever it occurs. In Europe about 100 species are recorded as occurring upon this plant, including 7 beetles, 55 lepidopterous larvæ, and 25 sawflies and gall flies. In the United States it is probable that fully as many species will be found. The most important of the American forms is the rose chafer (*Macrodactylus subspinosus*), which makes its appearance about the time the roses begin to bloom and strips the bushes, as well as grapevines and other plants, of the blossoms and foliage. The beetle is about one-third of an inch long and is of a light-yellowish color. It appears suddenly and in vast swarms in certain years and

ROSE CHAFER.
Adult female beetle (*Macrodactylus subspinosus*).

overruns gardens, vineyards, and orchards. In about a month or six weeks from the time of their first arrival, and generally after having done a vast amount of damage, the insects disappear as suddenly as they came. The range of the rose chafer is from Canada and Maine southward to Virginia and Tennessee and westward to Oklahoma and Colorado. The best remedies consist in plowing and cultivating the soil in the most favored breeding grounds, where these can be discovered. Against the adult beetles are used spraying with arsenical poisons, hand picking, covering choice plants with netting, and the poisoning of early-flowering plants as trap crops; but the beetles appear in such enormous numbers day after day as to make these measures apparently hopeless.

The rose sawflies, larvæ of which are known as rose slugs, frequently do considerable damage by skeletonizing the leaves. The bristly rose slug (larvæ of *Cladius pectinicornis*) has a wide distribution, feeding at first upon the lower

side of the leaves and gradually eating irregular holes until nothing remains but the stronger ribs. They form their cocoons in the autumn, among fallen leaves and other rubbish upon the surface of the ground, and in the summer sometimes do so upon the branches of the plant. There are two or three generations annually. The curled rose slug (larva of *Emphytus cinctus*) is a European species which has been imported into the northeastern United States. It eats the entire surface of the leaf, working along the edges, however, instead of gnawing holes. The American rose slug (larva of *Monostegia rosæ*) is the most prominent of the rose-sawfly larvæ. It is single-brooded, and the adults emerge in May about the time when the rose is in full leaf. The eggs are circular and are inserted singly in the edge of the leaf. The larva is about one-third of an inch long and is sluglike, the thorax being swollen. It feeds only at night and always upon the upper surface of the leaf, skeletonizing it rather than eating the entire substance. During the day it remains concealed on the undersurface of the leaf. The larva becomes full-grown in about two weeks, abandons the plant and enters the soil, where it constructs a delicate earthen cocoon. In this it remains dormant until the following spring, transforming to pupa shortly before the emergence of the adult insect in May. All of these sawfly larvæ may be readily destroyed by the application of powdered hellebore in a water spray.

The rosebud worm is the larva of a tortricid moth (*Penthina nimbatana*). It usually feeds upon the leaves, but frequently bores into rosebuds before they have opened. The parent moth appears in the spring and lays its eggs at night. The larva grows rapidly, feeding upon the leaves or the buds, and reaches full growth by the end of May, the moth appearing early in June. The eggs of a second generation are then laid, and in the Southern States there may be a third. Another tortricid moth, the oblique-banded leaf roller (*Cacœcia rosaceana*), is one of the most important of the leaf rollers and feeds upon many rosaceous plants. See LEAF ROLLER.

Fuller's rose beetle (*Aramigus fulleri*) is a weevil which feeds, when adult, upon the leaves and in the larval stage works upon the roots. It is a well-known greenhouse pest of many plants in California and made its appearance in the Eastern States as early as 1879. The adult beetle lays its eggs in flattened batches, thrusting them under the loose bark of the stem, usually near the ground. The larvæ burrow into the ground and feed upon the roots, reaching full growth in the course of one or two months and passing the pupa stage also under the ground. The rose curculio (*Rhynchites bicolor*) is abundant and destructive in certain of the Western States, and several species of cutworms (q.v.) are also injurious to young rose plants.

Consult Chittenden, in *United States Department of Agriculture, Division of Entomology, Bulletin 27* (new series, Washington, 1901); also *Circular 11* (2d series, ib., 1895).

ROSE LAUREL. See OLEANDER.

ROSEL'LA (Neo-Lat. dim. of Lat. *rosa*, rose), or ROSE PARRAKEET. A dealer's name, often spelled roselle, for one of the beautiful broad-tailed parrakeets of Australia (*Platycercus eximius*), remarkable for its rose-red plumage. In this species, which is common in captivity, the head, neck, and breast are rosy red, the cheeks white, the nape yellow, the feathers of the back black, with greenish-yellow borders, the lower breast yellow, with a scarlet band in the middle, the wings largely blue, and the hind parts and tail yellowish green. Its total length is 13.50 inches. It is distinguished from most other parrots by its cry, which is described as a kind of chattering or warbling. See Plate of PARROTS AND PARRAKEETS.

ROSELLE, rō-zĕl'. See HIBISCUS.

ROSELLE. A borough in Union Co., N. J., 1 mile west of Elizabeth, on the Lehigh Valley, the Central of New Jersey, and the Rahway Valley railroads (Map: New Jersey, D 2). Noteworthy buildings are the high school and borough hall. The manufacture of hydraulic machinery is the chief industry. Pop., 1900, 1652; 1910, 2725. Roselle Park, adjoining Roselle on the west, is a separate borough and is essentially a residential place. Pop., 1910, 3138.

ROSELLINI, rō'zĕl-lē'nē, IPPOLITO (1800–43). An Italian Egyptologist, born at Pisa. He studied at Bologna under Mezzofanti and in 1824 was made professor of Oriental languages in the university of his native town. From 1825 he devoted himself to the study of Egyptology. In 1828 Rosellini was sent to Egypt at the head of a Tuscan expedition which, uniting with a French expedition under the direction of Champollion, spent 15 months in exploring the monuments of Egypt and Nubia. The results of the expedition's work were published by Rosellini, after his return, in his *I monumenti dell' Egitto e della Nubia* (1832–44). Among his other works may be mentioned his *Elementa Linguæ Ægyptiacæ* (Rome, 1837) and his *Diccionario geroglifico*, which was left in manuscript, unfinished, at his death.

ROSE'MARY (OF. *rosmarin, romarin*, Fr. *romarin*, from Lat. *rosmarinus, ros marinus*, rosemary, sea dew, from *ros*, dew, and *marinus*, marine, from *mare*, sea; influenced by popular etymology with *rosa mariæ*, rose of the Virgin Mary), *Rosmarinus*. A genus of plants of the family Labiatæ. Only one species is known, *Rosmarinus officinalis*, an erect evergreen shrub 4 to 8 feet high, with linear leaves and pale-bluish flowers, growing in sunny places, on rocks, old walls, etc., in the Mediterranean region. It is generally cultivated as an ornamental and aromatic shrub. An essential oil, oil of rosemary, obtained from the leaves, is frequently used as a perfume and as a principal ingredient in Hungary water. Spirit of rosemary, made by distilling rosemary with rectified spirit, is used to perfume lotions and liniments. Wild rosemary (*Ledum palustre*), bog rosemary (*Andromeda glaucophylla*), and marsh rosemary (*Limonium carolinianum*) occur from Labrador southward.

ROSEN, rō'zen, CHARLES (1878–). An American landscape painter. He was born in Westmoreland Co., Pa., and studied at the National Academy of Design and also at the New York School of Art under W. M. Chase and Du Mond. Good examples of his landscapes, which are rendered in a simple and direct manner, with refined and pleasing color, are: "Washed-Out Bottomlands" (Minneapolis Society of Fine Arts); "Late Sunlight" (Duluth Fine Arts Association); "Old Willow Tree" (1908); "Summer Breeze" (1910); "A Rocky Ledge" (awarded the first Hallgarten prize in 1912); "Sun and Mist" (1914); "Ice-Bound

River" (1915). Rosen was elected to associate membership in the National Academy of Design in 1912.

ROSEN, rō′zen, FRIEDRICH AUGUST (1805–37). A German-English Orientalist. He was born in Hanover, was educated at Göttingen, Leipzig, and Berlin, where in 1824 he began to study Sanskrit under Bopp and in 1827 published his *Radices Sanscritæ*. In 1827 he went to Paris to study under Silvestre de Sacy and in 1828 became professor of Oriental literature in University College, London. Resigning his position in 1830 he published his *Rig-Vedæ Specimen* (1830), translated and edited the oldest of extant Arabic mathematical works, *The Algebra of Mohammed ben Musa* (1831), revised Haughton's Sanskrit-Bengali dictionary (1835), and compiled for the British Museum the Catalogue of Syriac Manuscripts, which was published (1838) after his death. In 1836 he was reappointed professor of Sanskrit at University College and prepared a collection of hymns of the *Rig-Veda* which, though left unfinished, was published by the Asiatic Society under the title *Rigveda-Sanhita, Liber Primus Sanscrite et Latine* (1838).

ROSEN, ROMAN ROMANOVITCH, BARON (1847–1921). A Russian diplomat. After studying at Reval, Dorpat, and St. Petersburg he entered the Department of Justice, from which he was promoted to that of Foreign Affairs. He was Consul General at New York from 1886 to 1894 and chargé d'affaires at Washington during Cleveland's first administration. He was at Tokyo as Secretary of Legation for one term and Minister for two terms, the second being interrupted by the outbreak of the Russo-Japanese War. He was appointed Ambassador to the United States in 1905 and was one of the Russian plenipotentiaries during the peace negotiations at Portsmouth.

ROSENAU, rōz′e-nou, MILTON JOSEPH (1869–). An American physician and sanitarian, born in Philadelphia, and educated at the University of Pennsylvania (M.D., 1889). After a postgraduate course in Berlin he served as surgeon of the Public Health and Marine Hospital Service from 1890 to 1909. During 1892–93 he was abroad, studying at Vienna, Paris, and Berlin. After his resignation he became professor of preventive medicine and hygiene at Harvard. Rosenau did important work in hygiene and sanitation—he acted as quarantine officer in San Francisco from 1895 to 1898 and in 1898–99 organized quarantine stations at several ports of Cuba. In 1903 he confirmed in Vera Cruz the observations on yellow fever made by Walter Reed (q.v.) in 1901. Rosenau wrote much on the subject of disinfection, especially of baggage, with formalin, and on protection against mosquitoes through the use of formaldehyde and sulphur dioxide. He also contributed on Pasteurization and milk supply, on diphtheritis and diphtheric serum, on anaphylaxis and on tuberculosis. He is the author of *Disinfection and Disinfectants* (1902), with F. J. Allan, translated into French in 1905.

ROSENBUSCH, rō′zen-bush, KARL HEINRICH FERDINAND (1836–1914). A German mineralogist, virtually the founder of scientific petrography. He was born in Einbeck, Hanover, studied at Freiburg, and became professor of mineralogy and geology at Strassburg in 1873. From 1877 till his retirement in 1907 he held a like chair at Heidelberg. There he became head of the Geological Institute of Baden in 1889. His great contributions to petrography have been a new classification and a wider use of the microscope. His chief works are: *Mikroskopische Physiographie der Mineralien und Gesteine* (1873–77; 4th ed., 1905–07); *Hilfstabellen zur mikroskopischen Mineralbestimmung in Gesteinen* (1888); *Elemente der Gesteinslehre* (1900).

ROSENHEIM, rō′zen-hīm. A town in Upper Bavaria, situated on the Inn, 40 miles by rail southeast of Munich (Map: Bavaria, D 5). It has saline springs in the vicinity. Its chief manufactures are machinery, matches, cement, salt, and metal articles. The trade is principally in wood. Pop., 1900, 14,246; 1910, 16,050.

ROSENKAVALIER, rō′zen-kä′vä-lēr′, DER, dēr (Ger., The Rose Bearer). An opera by Richard Strauss (q.v.), first produced in Dresden, Jan. 26, 1911; in the United States, Dec. 9, 1913 (New York).

ROSENKRANZ, rō′zen-kränts, JOHANN KARL FRIEDRICH (1805–79). A German philosopher, born at Magdeburg and educated at Halle, where he subsequently was professor (1831–33). In 1833 he became professor at Königsberg. He belonged to the so-called "centre" group of Hegelians. Besides his works in general literature he labored on a revision of Hegel's system. Among his works are: *Psychologie* (3d ed., 1863); *Hegels Leben* (1844); *Goethe und seine Werke* (1847; 2d ed., 1856); *Die poesie und ihre Geschichte* (1855); *Wissenschaft der logischen Idee* (1858–59). See Quäbicker, *K. Rosenkranz* (Leipzig, 1879).

ROSENTHAL, rō′zen-täl, ISIDOR (1836–1912). A German physiologist, born in Labischin, Prussia, and educated in Berlin. There he was assistant to Du Bois-Reymond in 1859–62, docent at the university from 1862 to 1867 and then assistant professor till 1872, when he was called to Erlangen as professor of physiology. He investigated the action of the tenth nerve upon respiration. Rosenthal edited the *Centralblatt für die medizinischen Wissenschaften* (1869–80), the *Biologisches Centralblatt* (1881 et seq.), and the *Internationale wissenschaftliche Bibliothek*, for which he wrote, "Allgemeine Physiologie der Muskeln und Nerven" (1877; Eng. trans., "General Physiology of Muscles and Nerves," 1881, in *International Science Series*). His other works include: *Electricitätslehre für Mediziner* (1862; 3d ed., 1883, under the title *Elektrizitätslehre und Elektrotherapie*); *Bier und Branntwein in ihrer Bedeutung für die Volksgesundheit* (1881; 2d ed., 1893); *Vorlesungen über öffentliche und private Gesundheitspflege* (1887; 2d ed., 1889); *Lehrbuch der allgemeinen Physiologie* (1901).

ROSENTHAL, MORIZ (1862–). An Austrian piano virtuoso, born at Lemberg. He studied under Karl Mikuli of Lemberg, Rafael Joseffy, and Franz Liszt. At the age of 13 he gave concerts in Vienna, Warsaw, and Bucharest, but two years afterward retired and studied at the University of Vienna. In 1882 he made successful concert tours throughout Europe and in 1887 made the first of many tours of the United States, after which he achieved great success in the principal art centres of England, France, Germany, and Russia. He proved himself possessed of a tremendous technic and an almost miraculous memory, and at the same time a player of utmost refinement and a master of tonal coloring.

ROSENTHAL, Toby Edward (1848–1917). An American figure and genre painter, born in New Haven, Conn. He studied in San Francisco under Henri Bacon and Fortunato Arriola and in Munich under Raupp and Piloty. Excepting occasional visits to America he lived principally in Munich. His works are executed in the romantic, rather conventional style of the early Munich school and, though good in technique, contain nothing distinctively American or even personal. They include: "Morning Prayers in the Bach Family" (Leipzig Museum, 1870); "Trial of Constance de Beverly" (1883); "Elaine" (1876); "Dancing Lesson during the Empire" (1886).

ROSENWALD, rō'zen-wäld, Julius (1862–). An American Jewish merchant and philanthropist, born at Springfield, Ill. He was engaged in business in New York in 1879–85, was senior member of the Chicago firm of Rosenwald and Weil, clothiers, in 1885–95, and served as vice president and treasurer (1900–08) and thereafter as president of Sears, Roebuck & Co. On his fiftieth birthday he made gifts to various civic, philanthropic, and educational enterprises, amounting to $687,000. In 1913 he gave a total of $100,000 towards the construction of Y. M. C. A. buildings for colored men and boys in Washington, Chicago, Indianapolis, and Philadelphia.

ROSE OF JERICHO, jĕr'ĭ-kō, Resurrection Plant (*Anastatica hierochuntica*). A small Arabian herb of the family Cruciferæ. After flowering the leaves fall off, and the branches become incurved towards the centre, so that the plant becomes almost globular. In this state it is often blown about by the wind. When it happens to be blown into water, the branches expand again, the pods open and let out the seeds. If taken up before it is quite withered, the plant retains for years its hygroscopic property of contracting in drought and expanding in moisture. *Odontospermum,* or *Asteriscus, pygmæum,* a composite, is said to be the true rose of Jericho.

ROSE OF JERICHO.
d, dried condition.

ROSE OF LIMA, lē'mâ, Saint (1586–1617). The first American saint. She was born at Lima, Peru, April 20, 1586, and from an early age gave herself to a life of extraordinary austerities and self-mortifications. At the age of 20 she took the veil as a sister of the Third Order of St. Dominic. She died at Lima, Aug. 24, 1617. In 1669 she was named patron of "America and the Indies" and was canonized by Clement X in 1671. Her day is August 30. The chief source for her life is the *Vita Sanctæ Rosæ* by the Dominican Hemsen (1664; Ger. trans., 2d ed., Regensburg, 1863).

ROSE OF SHAR'ON. A name variously applied to the autumn crocus (*Colchicum autumnale*), to polyanthus narcissus (*Narcissus tazetta*), and, in America, to the Syrian hibiscus (*Hibiscus syriacus*). See Crocus; Hibiscus; Narcissus.

ROSE'OLA (Neo-Lat., from Lat. *roseus,* rosy, from *rosa,* rose). A name given to an eruption accompanying several diseases, such as erythema and German measles or rubeola. There is a *roseola ab ingestis* which is due to intestinal or gastric disturbances and which resembles very closely the eruption of scarlet fever.

ROSE POLYTECHNIC INSTITUTE. A school of engineering founded in 1874 at Terre Haute, Ind., by Chauncey Rose (q.v.). It was opened for students in 1883. The institution offers five parallel courses of study: mechanical, electrical, civil, architectural, and chemical engineering, each occupying four years. The degree of B.S. is conferred on all graduates and that of M.S. for at least one year of graduate work. The degree of mechanical, electrical, civil, architectural, or chemical engineer may be granted to the holders of the master's degree after two years in the practice of their profession in positions of responsibility. The number of students was limited (1915) to 200, but on the erection of a new plant was to be increased. A plan provided (1915) for a larger institution to occupy a campus of 125 acres, with nine buildings, fully equipped with laboratories and shops. The productive funds in 1915 amounted to about $800,000.

ROSE QUARTZ. A variety of quartz, usually crystallized, but sometimes found massive. It has a delicate pink or flesh color, due to the presence of minute quantities of manganese or titanium oxide. It is valued as an ornamental stone, and the larger pieces are made into vases, while the smaller fragments are used for jewels, seals, etc. The variety possessing a bright-red color is sometimes called Bohemian ruby.

ROSES, Attar of. See Attar of Roses.

ROSES, Wars of the. The series of civil wars in England between the rival houses of Lancaster and York in the latter half of the fifteenth century. The struggle owed its name to the fact that the badge of the house of Lancaster was a red rose and that of the house of York a white rose. The house of Lancaster had obtained the throne of England in 1399 by an Act of Parliament which had deposed Richard II and given the crown to his cousin Henry IV. During the reigns of Henry IV and Henry V there was no open discontent, for the country was prosperous and under the latter King the military successes in France appealed to the national pride. But when Henry V died, in 1422, he left as heir a child of nine months, Henry VI, who, when he grew to manhood, proved to be weak physically and mentally. Moreover, the country was exasperated by the loss of the French possessions (see Hundred Years' War), and the poor were in dire distress on account of the excessive taxa-

tion. Under such circumstances the people began to look to Richard, Duke of York, who, descended from Lionel, the second son of Edward III, had, if hereditary right was to be regarded, better claims to the throne than Henry VI, descended from John of Gaunt, the fourth son of Edward III. The first armed demonstration was Jack Cade's Rebellion (1450), which began in Kent and was directed against the favorites of Henry VI. The chief demand of the insurgents was that the government should be placed in the hands of the Duke of York. This rising was easily suppressed, but in 1453 Henry VI became insane, and in 1454 the Duke of York was declared Protector. Henry VI, however, soon recovered his reason, and York, fearing destruction, took up arms. In general the country districts were Lancastrian, while the commercial centres (especially London) sided with the Yorkists. In 1455 the first battle of the war took place at St. Albans. York was victorious, and when, shortly after, Henry again became insane, the Protectorate was reëstablished. In 1456 the King recovered his reason and the Duke of York resigned. Meanwhile, however, the Earl of Warwick, the most powerful supporter of the Yorkists, continued in rebellion until in 1460 the strife again became general. The royal army was defeated at Northampton and the King captured, and Parliament declared Richard heir to the crown, thus excluding Edward the son of Henry VI. This last action aroused the Queen, Margaret of Anjou (q.v.), and she collected an army in the North. On Dec. 31, 1460, the Duke of York was defeated and slain at Wakefield. His successor was his son Edward, Earl of March, who on Feb. 2, 1461, defeated some Lancastrian forces at Mortimer's Cross. Meanwhile Margaret was advancing on London and on her way defeated Warwick in the second battle of St. Albans on February 17 and released Henry, who had been in Warwick's hands. Edward hastened to London and on March 2, 1461, assumed the crown as Edward IV. On March 29 the decisive battle of Towton was fought. Edward was victorious, and Margaret fled with Henry to Scotland.

Since nearly all the great nobles were Lancastrians, Edward IV sought to conciliate the Commons and increased their privileges. The civil strife for a while went on in a desultory way. In 1462 Margaret was again in northern England, but in 1464 Warwick's brother, Lord Montague, defeated her at Hedgeley Moor and Hexham, and in 1465 Henry was captured and thrown into the Tower. Suddenly in 1469 Warwick deserted Edward IV for Henry VI. His followers were defeated at Stamford, but Warwick fled to France and there obtained aid from Louis XI and with his new forces landed in England. Edward IV escaped to Holland, and Henry VI was taken from the Tower and replaced on the throne. But Edward soon returned and on April 14, 1471, won the battle of Barnet, in which Warwick and Montague lost their lives. On May 4 Margaret was defeated at Tewkesbury, and her son was slain after the battle, while shortly after Henry VI was probably murdered in the Tower, whither he had been taken after the battle of Barnet.

The battle of Tewkesbury ended all effective resistance to the Yorkist rule until the reign of Richard III (q.v.). His unpopularity enabled the Duke of Richmond, the head of the house of Lancaster, to invade England in 1485. On Aug. 22, 1485, Richard III was defeated and slain at Bosworth Field, and Richmond became King as Henry VII (q.v.). On Jan. 18, 1486, Henry married Elizabeth, the daughter of Edward IV and heiress of the Yorkist family. Thus the rival dynasties were united. The chief results of the Wars of the Roses were the extirpation of the ancient nobility and the reduction of Parliament to the position of a tool of faction. This rendered possible the despotism of the Tudors. Consult: J. H. Ramsay, *Lancaster and York* (2 vols., Oxford, 1892); James Gairdner, *The Houses of Lancaster and York* (10th impression, London, 1900); C. W. C. Oman, *History of England from the Accession of Richard II to the Death of Richard III* (New York, 1906); K. H. Vickers, *Humphrey, Duke of Gloucester* (London, 1907).

ROSE'S METAL. See Fusible Metal.

ROSETTA, rō-zĕt'tȧ (Ar. *Er Rashid*). A town and port of northern Egypt, in lat. 31° 25′ N., on the west bank of the Rosetta branch of the Nile and about 4 miles from the mouth of the river (Map: Egypt, C 1). It is the modern representative of the ancient Bolbitine, which lay a little farther north. In the Middle Ages Rosetta was a place of considerable commercial importance, and it continued to flourish until the construction of the Mahmudiyeh Canal and the improvement of the harbor of Alexandria diverted most of its trade to the latter city. Rosetta still has thriving manufactories of sailcloth, leather, and iron and exports a considerable quantity of rice, linseed oil, and oil of sesame. The population numbers about 16,000. See Rosetta Stone.

ROSETTA STONE. A slab of black basalt bearing an inscription which was the key to the interpretation of Egyptian hieroglyphics. It was found in 1799 by M. Boussard, a French officer of engineers in the trenches at Fort Saint-Julien, near Rosetta (q.v.), and is now in the British Museum. The upper portion and the lower right-hand corner have been broken away, and in its present condition it measures 3 feet, 9 inches in height, 2 feet, 4½ inches in breadth, and 11 inches in thickness. Upon it is inscribed in hieroglyphics, in demotic writing, and in Greek, a decree of the Egyptian priesthood, assembled at Memphis, in honor of Ptolemy V Epiphanes (205–181 B.C.). It is dated March 27, 195 B.C., and, after reciting the numerous benefits conferred by Epiphanes upon his country as well as upon the temples and the clergy, provides that the King's statue shall be placed in the sanctuary of every temple and that divine honors shall be paid to him. It is further provided that a copy of the decree, inscribed upon a stele of hard stone, shall be placed in every temple of the first and second rank. The Greek version of the decree, containing 54 lines of text, is well preserved, though the ends of some of the lines are broken away. Of the hieroglyphic inscription, 14 partly mutilated lines, constituting about half the text, remain, while the demotic text (32 lines) is almost entire. The Rosetta stone, by placing in the hands of scholars two long Egyptian texts representing different periods of the language, together with a Greek translation, furnished the means whereby a knowledge of the long-lost tongue of ancient Egypt was regained and thus opened the way for the great achievements of modern Egyptology. (For an

account of the work of decipherment, see EGYPTOLOGY.) Another trilingual inscription, containing a similar decree in honor of Ptolemy III, Euergetes I (247–222 B.C.), was found at Tanis in 1866, and has served to confirm the methods and results of Champollion and his followers.

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ROSETTI, rō-sĕt'tē, CONSTANTIN (1816–85). A Rumanian poet and politician, born at Bucharest. He took a prominent part in radical agitation, was a member of the Revolutionary Committee in 1848, and held several public offices. In 1850 his journal, *Pruncul Român*, was suppressed. He was Minister of Education in 1866, became President of the Chamber of Deputies in 1877, and was Minister of the Interior in 1881–82. During his last years he was editor of *Românul*. He published one volume of original verse, *Ceasuri de multumire* (1840), and some translations. His collected works appeared at Bucharest in 1885.

ROSE'VILLE. A city in Placer Co., Cal., 18 miles northeast of Sacramento, on the Southern Pacific Railroad (Map: California, D 4). There are extensive shops and yards of the Southern Pacific system and a large ice plant. Pop., 1910, 2608.

ROSE WATER. See PERFUMERY.

ROSE'WATER, VICTOR (1871–). An American journalist and political leader, born in Omaha, Neb. He was educated at Columbia University (Ph.B., 1891; A.M., 1892; Ph.D., 1893) and joined the staff of the Omaha *Bee*, of which he became managing editor in 1895 and editor and vice president in 1906. He identified himself prominently with the Republican party, of whose national committee he was chosen chairman in 1912. In the convention of that year he was a consistent supporter of Taft and was chairman of the committee that decided seat contests unfavorably to Roosevelt's interest. He upheld conservative reform, especially in connection with conservation, the convention system, and workingmen's compensation. As an expert in municipal finance he gave special lectures in the universities of Nebraska (1894) and Wisconsin (1904). Rosewater published *Special Assessments: A Study in Municipal Finance* (1893).

ROSE WINDOW. A large circular window, usually with tracery and stained glasses, used especially in Gothic churches over the portals. See WINDOW.

ROSE'WOOD. The commercial name of the wood of several trees valued for beauty and used for ornamental furniture. The principal species is thought to be a Brazilian *Mimosa*. Several species of *Dalbergia*, of the family Leguminosæ, are also believed to be rosewoods, but in general the botanical names are in doubt. Various kinds of rosewood, imported from South America, are much used for veneering, in making furniture, musical instruments, etc. Rosewood has for a long time been second only to mahogany as a furniture wood. It varies in color from reddish brown to purple or almost black, often beautifully marked with streaks of dark red. When being sawed or cut it yields an agreeable smell of roses, hence its name. The name "rosewood" has been given also to kinds of timber grown in Jamaica, in Africa, and in Burma. One valuable kind of rosewood is yielded by an East Indian tree, *Dalbergia latifolia*, also called blackwood. It is found chiefly in Malabar and grows to a height of about 50 feet. The increasing value of the wood has led to the formation of new plantations, under the care of the government conservator of forests, in several parts of the Madras Presidency. The value of rosewood depends upon its coloring, the usual price being from $50 to $90 per ton, though exceptional specimens have sold as high as $450 per ton. The principal supplies come from Brazil, the Canary Islands, East Indies, and Africa. In Australia the name "rosewood" is applied to the timber of *Eremophila mitchelli*, *Dysoxylum fraseranum*, and *Acacia glaucescens*, all of which are close-grained, dark-colored, and pleasantly scented. The genera *Pterocarpus* and *Machærium* also supply rosewood. In tropical America *Dicypellium caryophyllatum*, *Amyris balsamifera*, and *Physocalymma scaberrimum* yield rosewood.

ROS'ICRU'CIANS (ML. *Rosicrucianus*, from Lat. *rosa*, rose + *crux*, cross, Latinized from Ger. *Rosenkreutz*, Rose Cross, the name applied to the society either on account of the emblem and pseudonym adopted by Johann Valentin Andreæ, erroneously regarded as the founder or restorer of the order, or because of the titles Brothers of the Rosy Cross, Rosy Cross Knights, and Rosy Cross Philosophers, assumed by the society; sometimes supposed to be a corruption of *Roscicrucian* or *Roricrucian*, from Lat. *roscidus*, dewy, from *ros*, dew + *crux*, cross, since mediæval alchemists considered dew the most powerful solvent of gold, and the cross the synonym of light). The members of secret societies, professing to be philosophers but in reality charlatans, who in the seventeenth and eighteenth centuries made themselves conspicuous by claiming to be possessed of secrets of nature, including the power to transmute the baser metals into gold, to prolong life by the use of the *elixir vitæ*, to have a knowledge of passing events in distant places, and to discover hidden things by the application of the Cabbala (q.v.). Rosicrucianism stood in some connection with Freemasonry and owed its vogue in the eighteenth century to the passion for secret associations and for pseudoscience. Consult H. Silberer, *Probleme der Mystik und ihrer Symbolik* (Vienna, 1914), and H. S. Lewis, *History of the Rosicrucian Order in America* (New York, 1915).

ROSIN, rŏz'ĭn. See NAVAL STORES; RESINS.

ROSINANTE, rŏz'ĭ-năn'tē. The lean, raw-boned steed of Don Quixote.

ROSIN (rŏz'ĭn) **BIBLE.** See BIBLE, CURIOUS EDITIONS OF.

ROSIN WEED. See SILPHIUM.

ROSKILDE, rŏs'kĭl-dē. A town on the island of Zealand, Denmark, situated at the head of the Roskilde Fiord, 16 miles west of Copenhagen, at the converging point of the three principal railroad lines of Zealand (Map: Denmark, F 3). It contains a magnificent cathedral, erected 1074–84, rebuilt in the twelfth century

and containing the tombs of Danish kings. Pop., 1901, 8368; 1911, 9696. Roskilde is one of the oldest towns of Denmark. Previous to 1443 it was the capital of the kingdom and the residence of the royal family, but its decline was consequent on the rapid growth of Copenhagen, and fire and the ravages of the plague destroyed its prosperity. A treaty was concluded here in 1658 between Denmark and Sweden, in which the former relinquished her possessions beyond the Sound.

ROSLAVL, rôs-läv'ly'. A district town in the Government of Smolensk, Russia, situated on the river Oster, 73 miles southeast of Smolensk (Map: Russia, D 4). Its chief manufactures are oil and tobacco. Pop., 1911, 27,546.

ROSLIN, rŏz'lĭn, **ROSLYN,** or **ROSSLYN.** A village of Edinburghshire, Scotland, overlooking the beautiful valley of the North Esk, 4½ miles southwest of Dalkeith (Map: Scotland, E 4). It is famous for its collegiate chapel, dating from 1446 and commemorated in Sir Walter Scott's ballad of *Rosabelle.*

ROSLIN, Alexander (1718–93). A Swedish portrait painter, born in Malmö. He studied in Paris, where he became one of the most fashionable portraitists of his day, and where he was received into the Academy in 1753. He revisited Sweden (1773–75) and spent two years in Russia (1775–77). His portraits in oil and pastel are pleasing likenesses and show delicacy of execution and skill in the rendering of material. There are eight works by him in the Louvre, and he is also well represented at Versailles and in the Stockholm Gallery, which possesses the portraits of himself and his wife and the group of Gustavus III and his brother.

ROSLYN, rŏz'lĭn. A city in Kittitas Co., Wash., 106 miles by rail southeast of Seattle, on the Northern Pacific Railroad (Map: Washington, E 3). Roslyn is a commercial town and the centre of the chief coal-mining district of the State. Pop., 1900, 2786; 1910, 3126.

ROSMAR'IDÆ. See Carnivora.

ROSMEAD, Hercules George Robert Robinson, first Baron. See Robinson, Sir H. G. R.

ROSMINI-SERBATI, rôs-mē'nē-sĕr-bä'tē, Antonio (1797–1855). An Italian philosopher. He was born at Roveredo, near Trent, in Tirol. He became a priest in 1821, and in 1828 he founded a religious order called the Institute of Charity, whose members, known as Rosminians, were to devote themselves especially to preaching and education. During the troublous times in 1848 Rosmini was an adviser of Pope Pius IX. He was in sympathy with the national idea and looked forward with enthusiasm to a united Italy. He was influenced by Gioberti (q.v.), who was at that time a member of the Piedmontese Ministry. With the rising influence of Cardinal Antonelli, Rosmini lost the favor of the Pope. His work on Church reform, called *The Five Wounds of the Church* (1848), and his tract *The Constitution According to Social Justice* (1848) were put upon the Index. His works are published in 35 volumes. They have been translated into English by Thomas Davidson (London, 1882), with copious notes, full bibliography, and a well-written *Life.* "Objective idealism, subjective realism, and absolute moralism" is the description Mr. Davidson gives of the Rosminian doctrine. Rosmini's definition of morality as action controlled by absolute truth is the basis of his ethical teaching. His system of philosophy partakes somewhat of Kantianism. In psychology Rosmini was an ontologist. Everything is known in the idea of not actual but possible being, which is inborn; only the determinative details of knowledge are drawn from the senses. Rosmini's writings were condemned by the Congregation of the Index in 1849, and he at once submitted and retired to Stresa, on Lake Maggiore, and there he died. He was a man of exalted character. His industry was great. In addition to his published works, there are 60 volumes remaining in manuscript. Besides the philosophical-theological works of Rosmini there are in English *The Ruling Principle of Method Applied to Education* (Boston, 1887) and *Maxims of Christian Perfection* (London, 1889). Consult: F. Paoli, *Della vita di Antonio Rosmini-Serbati* (2 vols., Turin, 1880–84); Albrecht Stöckl, *Geschichte der neuern Philosophie* (Mainz, 1883); Karl Werner, *Die italienische Philosophie des 19ten Jahrhunderts* (Vienna, 1884); William Lockhart, *Life of Rosmini* (London, 1892).

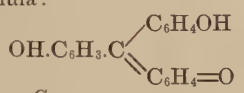
ROSNY, rô'nē', Baron de. See Sully, Duke de.

ROSNY, J. H. Pseudonym of the French writers Henry (1856–) and Justin (1859–) Boex. Both were born in Brussels. Henry removed to Paris and early became a member of the Naturalistic school. His early work was not done in collaboration. After some time spent in London he published (1885) his first novel, *Nell Horn,* a story of the Salvation Army and a simple delineation of theorists and social reformers, especially those in the middle or lower classes. Possibly his masterpiece is *Le bilatéral* (1886), with its theme of French socialism in the early 80's and a style of treatment approaching Zola. In 1887, with four others, he attacked the gross realism of Zola's *La Terre* and allied himself with the Goncourts (q.v.), of whose academy the two brothers were original members. Subsequently Henry published: *L'Immolation* (1887), a story of life in the country, and *Le termite* (1890), on literary life in Paris. Henry and Justin collaborated on *Daniel Valgraive* (1891); *L'Impérieuse bonté* (1894), dealing with Parisian charity; *L'Indomptée* (1894), a powerful tale of a girl who studied medicine in Paris; *Le serment* (1896, dramatized 1897); *Les âmes perdues* (1899), on modern anarchism; *L'héritage* (1902); *Le crime du docteur* (1903); *Le docteur Harembourt* (1904); *Le millionaire* (1905); *Sous le fardeau* (1906); *Vers la toison d'or* (1908); *Le testament volé* (1909); *La mort de la terre* (1912). After 1910 the brothers again wrote individually, Henry publishing *La guerre du feu* (1913) and *La force mystérieuse* (1914), and Justin, *Sépulcres blanchis* (1913) and *La carapace* (1914). The characters in all these novels are realistic and striking, but are not minutely analyzed.

ROSNY, Léon Louis Lucien Prunol de (1837–). A French Orientalist. He was born at Loos, studied in Paris at the Ecole des Langues-Orientales, was appointed professor of Japanese at the Bibliothèque Impériale and in 1863 interpreter to the Japanese ambassadors at Paris, whom he accompanied to Holland, England, and Russia. He was appointed to the newly created chair of Japanese in his alma mater in 1868, in 1884 was decorated with the Legion of Honor, and in 1886 was nominated assistant director of the Ecole des Hautes-

Etudes. Among his numerous works some of the more important are: *Introduction à l'étude de la langue japonaise* (1857; 2d ed., 1897); *Les écritures figuratives et hiéroglyphiques des différents peuples anciens et modernes* (1860; 2d ed., 1870); *De l'origine du langage* (1869); *Extraits des historiens du Japan* (1874–75); *Les peuples orientaux connus des anciens Chinois* (1882; 2d ed., 1886); *Vocabulaire de l'écriture hiératique yucatéque* (1883; 2d ed., 1886); *Le livre sacré et canonique de l'antiquité japonaise* (1885); *Les populations danubiennes* (1882–85), with an atlas; *Taureaux et mantilles: Souvenirs d'un voyage en Espagne et en Portugal* (1882; 3d ed., 1894); *Le Taoïsme* (1892); *Courts pratique de la langue japonaise* (1903); *L'Amérique précolombienne* (1904); *La Bible du Japon* (1904).

ROSOLIC (rō-zŏl'ĭk) **ACID** (from *rose*), $C_{20}H_{16}O_3$. A red crystalline substance, melting above 270° C. (518° F.). It is insoluble in water, but dissolves in alkalies and in alcohol. Its alkaline solutions are colored red, while its alcoholic solutions have an orange-yellow color. It may be obtained by heating a mixture of carbolic acid and cresol with sulphuric acid and arsenic. Owing to the difficulty of fixing it, it is not much used as a dye. Chemically rosolic acid is closely allied to aurin (q.v.), and its constitution is represented by the following formula:



See Coal-Tar Colors.

ROSS, Adrian. See Ropes, Arthur Reed.

ROSS, Alexander (1699–1784). A Scottish poet, born in the parish of Kincardine O'Neil, Aberdeenshire. He was educated at Marischal College, Aberdeen, from which he received his M.A. degree in 1718; after some experience as a private tutor and teacher he became in 1732 schoolmaster at Lochlee in Angus, where he remained until his death. Though a prolific writer of verses, his only publication was *The Fortunate Shepherdess: A Pastoral Tale in the Scottish Dialect* (1768), which has a humorous preface by Dr. James Beattie and contains several songs still popular in Scotland. Consult the edition under the title *Helenore,* by J. Longmuir (1866).

ROSS, Alexander (1742–1827). A British general, born in Scotland. He served in Germany in the Seven Years' War and attained the rank of captain in 1775 and that of major in 1780. He served in the American War of Independence as aid-de-camp of Lord Cornwallis and was the commissioner appointed by Cornwallis to arrange his surrender at Yorktown in 1781. In 1783 he became deputy adjutant general in Scotland, served throughout the campaign of Cornwallis against Tippu Sahib in India, fighting in every battle, was promoted colonel in 1793 and appointed governor of Fort George, and became general in 1812.

ROSS, Alexander (1783–1856). A Canadian author and pioneer. He was born in Nairnshire, Scotland, emigrated to Canada in 1805, taught school for a time in Glengarry, Upper Canada, and in 1810 went with John Jacob Astor's expedition to Oregon. About 1825, after many years' service with the Hudson's Bay Company, he settled in the Red River country, where he was sheriff and member of the Council of Assiniboia. He wrote: *Adventures of the First Settlers on the Oregon or Columbia River* (1849); *The Fur Hunters of the Far West* (1855); *The Red River Settlement: Its Rise, Progress, and Present State* (1856).

ROSS, Alexander Milton (1832–97). A Canadian naturalist, born in Belleville, Ontario. He graduated in medicine in New York in 1855. During the Civil War he served as a surgeon in the Federal army and at its close served in Mexico under Juárez. He then returned to Canada and devoted himself to the study of natural history. He published: *Recollections of an Abolitionist* (1867); *Birds of Canada* (1872); *Butterflies and Moths of Canada* (1873); *Flora of Canada* (1873); *Forest Trees of Canada* (1874); *Mammals, Reptiles, and Freshwater Fishes of Canada* (1878); *Vaccination a Medical Delusion* (1885); *Medical Practices of the Future* (1887).

ROSS, Betsy (1752–1836). Maker of the first American flag. A daughter of Samuel Griscom, who assisted in the erection of Independence Hall, she was born in Philadelphia, and in 1773 was married to John Ross (died 1776), nephew of George Ross (q.v.) (1730–79). After the Continental Congress had decided upon the design for a national flag (June 14, 1777), a committee comprising George Washington, Robert Morris, and George Ross called upon Mrs. Ross and requested her to undertake the sewing of it. She accepted, and offered the suggestion, adopted, that five-pointed stars be used in the design instead of six-pointed ones. Mrs. Ross received a contract to make all government flags, and her daughter, Mrs. Clarissa Wilson, continued the business until 1857. In 1898 was formed the Betsy Ross Memorial Association, which by 1905 had converted the old home of Betsy Ross on Arch Street into public property as the American Flag House.

ROSS, Edward Alsworth (1866–). An American sociologist, born at Virden, Ill. He graduated at Coe College, Cedar Rapids, Iowa, in 1886 and took graduate courses at Berlin and Johns Hopkins. After 1891 he held chairs successively at the following universities: Indiana, Cornell, Leland Stanford, Nebraska, and Wisconsin (after 1906). His resignation, under pressure, from his post at Leland Stanford in 1900 caused widespread discussion of the right of academic free speech. In 1896 and 1905 Ross lectured at the University of Chicago and in 1902 at Harvard. He wrote: *Sinking Funds* (1892); *Honest Dollars* (1896); *Social Control: A Survey of the Foundation of Order* (1901); *Foundations of Sociology* (1905); *Sin and Society* (1907); *Social Psychology* (1908, 1913); *Latter Day Sinners and Saints* (1910); *The Changing Chinese* (1911); *Changing America* (1912); *The Old World in the New* (1914); *South of Panama* (1915).

ROSS, Edward Denison (1871–). An English Orientalist. He studied at University College, London, at Paris, and at Strassburg, traveled in the East, and after five years in the chair of Persian at University College, in 1901–11 was principal of the Calcutta Madrasah. From 1911 to 1914 he was in charge of the Records of India and was assistant secretary in the Department of Education. Thereafter he served as keeper of the Stein antiquities in the British Museum. He published: *A History of the Moghuls of Central Asia* (1898), a translation of the *Tarikh-i-Rashidi* of Mirza

Haidar; *The Heart of Asia* (1899), with Skrine; a biographical sketch of Omar Khayyam prefixed to an edition of FitzGerald's version (1900); an edition of Abū Turāb's *History of Gujarat* (Calcutta, 1909); *The Persian and Turki Dîvans of Bayram Khān* (ib., 1910); and the *Story of the Ti-Med-Kun-Den: A Tibetan Nam-thar* (ib., 1912), with a translation.

ROSS, GEORGE (1730–79). A signer of the Declaration of Independence. He was born in New Castle, Del., studied law with an elder brother in Philadelphia, and established himself at Lancaster, Pa. In 1768 he was elected to the Pennsylvania Legislature and was repeatedly reëlected. He espoused the cause of the Indians and strove to protect them against unscrupulous whites. He was one of the seven delegates from Pennsylvania to the Continental Congress of 1774, continued a member of that body until January, 1777, and signed the Declaration of Independence. During the same period he continued to sit in the Pennsylvania Legislature and in that capacity did much towards putting the State into a condition of defense. In April, 1779, he was commissioned Judge of the Pennsylvania Court of Admiralty, but died not long after taking office. Consult Nathaniel Dwight, *Lives of the Signers* (New York, 1876).

ROSS, GEORGE (1845–92). A Canadian physician. He was born and educated in Montreal. Graduating in medicine from McGill University (1866), he became connected with several Montreal hospitals and with his alma mater, holding the chairs of hygiene (1871–73), clinical medicine (1872–89), and medicine (1889–91). Ross was governor of the College of Physicians and Surgeons of Quebec, vice president of the American Association of Physicians, and president of the Canadian Medical Association.

ROSS, SIR GEORGE WILLIAM (1841–1914). A Canadian educator and statesman, born near Nairn, Ontario, and educated in the Toronto Normal School and in the Law School of Albert University. He was called to the bar in 1887. At that time he had long been prominent in educational affairs as teacher and organizer and from 1872 to 1883 had been a Liberal member of the Dominion House of Commons. In 1883 he became Minister of Education for Ontario and in 1899–1905 was Premier and Treasurer of the Province. In 1907 he was called to the Dominion Senate. Ross in 1887 procured the passage of a law federating the University of Toronto and affiliating denominational colleges therewith. He also bore a prominent part in opening up to settlement the northern and northwestern part of Ontario, called New Ontario, by the construction of the Timiskaming and Northern Ontario Railway. He was widely known as an orator and lecturer, and an agitator for temperance reform and prohibition. He wrote: *Life and Times of Alexander Mackenzie* (1892), with William Buckingham; *The Universities of Canada: Their History and Origin* (1896); *The School System of Ontario* (1896), vol. xxxviii in the "International Educational Series"; *Getting into Parliament and After* (1913); *The Senate of Canada* (1914).

ROSS, HANS (MATTHIAS ELISÆUS) (1833–1914). A Norwegian philologist, born in Mandalen. Educated at Christianssand and at Christiania University for the ministry, in Germany, and in England, he taught in colleges from 1855 till 1877. Then, with government financial support, he began gathering linguistic material and compiling popular traditions. The main result was his important *Norsk Ordbog* (1889–95; supplements, 1902–13). Intended as an addition to Ivar Aasen's *Dictionary*, it contains 40,000 more words than Aasen's. Another important work was "Norske Bygdemaal" (Norwegian Dialects), five volumes, in *Videnskabs-Selskabet i Christiania, Skrifter*, II (1905–09). Ross published also *Ein Soge-Bundel* (1869) and was one of the founders of *Det Norske Samlaget* (1868).

ROSS, SIR HEW DALRYMPLE (1779–1868). A British field marshal, born in Galloway County, Scotland. He became a sublieutenant in the Royal Artillery in 1795, was promoted captain in 1806 and commanded the famous Chestnut Troop of the Royal Horse Artillery in the Peninsular War in 1809–14. He led it in the battle of Waterloo. In 1840–54, as deputy adjutant general of artillery, he directed the entire artillery service of the British army, in the latter year preparing the artillery for the Crimea. Promoted through the grades to field marshal in 1868, Ross received the G.C.B. in the same year.

ROSS, SIR JAMES CLARK (1800–62). An English navigator and Arctic and Antarctic explorer, born in London. He entered the navy under his uncle, Sir John Ross, in 1812, accompanied him on his first expedition to discover the Northwest Passage (1818), and participated in the voyages of Captain Parry (1819–25), and also in 1827, when Parry made the highest point north reached up to that time. Ross served on the four years' expedition of his uncle, Sir John Ross (q.v.). On this expedition the younger Ross in his sledge journeys discovered King William Land and determined the position of the north magnetic pole off the west coast of Boothia Felix (1831). In 1834 he was made a post captain. In 1839 he commanded the expedition suggested by the Royal Society and the Royal Geographical Society for the discovery of the southern magnetic pole. In 1840 his two vessels, the *Erebus* and the *Terror*, pushed through the ice pack southward of New Zealand, sailing along the 170th meridian, east longitude, and on Jan. 11, 1841, he discovered in lat. 71° 15′ S. a new land, rising in high peaks. Ross proceeded in a southerly direction along the coast, landing at two islands, Possession Island and Franklin Island. On January 28 he came upon an active volcano more than 12,000 feet high, which he named Mount Erebus. He then sailed to the eastward along the front of a lofty sea glacier called the *Barrier* and returned to Tasmania. He named the new territory Victoria Land. It proved to be the most accessible part of the ice-clad continent of Antarctica and has been revisited by many other expeditions. (See POLAR RESEARCH.) In 1842 Ross revisited this land and reached a latitude of 78° 10′ S., which remained the lowest southern record until Borchgrevink reached 78° 50′ in 1900. According an ungracious reception to a chart of discoveries sent to him by Lieut. Charles Wilkes (q.v.), Ross omitted Wilkes's Antarctic Continent from his own charts, which gave rise to a long and bitter controversy. Subsequent explorations have eliminated Parry Mountains and three islands from the discoveries of Ross. While immaterial portions of Wilkes's assumed land have disappeared, his Antarctic Continent, stretching

through 70 degrees of longitude, has been permanently restored by the explorations of Mawson (q.v.) of 1911–14. Ross indicated a location of the southern magnetic pole in Victoria Land, and though his observations were not altogether accurate, his expedition was the best conducted and one of the most important of the early Antarctic voyages. He arrived in England in 1844 and was knighted. In 1848 he commanded an expedition to Baffin Bay in a vain quest for Sir John Franklin. He was made rear admiral in 1856. He described his Antarctic discoveries in *A Narrative of a Voyage in Antarctic Regions* (1847).

ROSS, Sir John (1777–1856). A British Arctic explorer and naval officer, born at Inch, Wigtonshire, Scotland. He entered the navy in 1786 and took part in the wars with France. In 1818 he was sent to attempt the discovery of a Northwest Passage. His vessel was the *Isabella*, and he was accompanied by Parry in charge of the *Alexander*. He sailed along the west coast of Greenland to lat. 76° 54′ N. beyond the Carey Islands, met the Cape York natives, and gave them the name of Arctic Highlanders, which has ever since been applied to them. Turning south along the west side of Baffin Bay, he entered Lancaster Sound, which he explored for 50 miles. He erroneously concluded that it was a deep bay and turned back. His voyage was a failure, and it was not till 1829 that Ross, who was recognized as an able and courageous sailor, was intrusted with the command of another expedition. He started on this quest for the Northwest Passage in the small paddle-wheel steamer *Victory*, the first steam vessel used in Arctic exploration. The steam power proved a failure. Ross passed Bellot Strait, thinking it was a bay. He discovered and named Boothia Felix, the most northerly extension of the American mainland. Other important discoveries were made, largely by sledging parties under James C. Ross, his nephew. In 1831 the position of the north magnetic pole was determined. Three winters were passed in this region, until failure of food compelled Ross to abandon his vessel, still frozen in the pack, and make a desperate march north to Fury Beach, where caches of food supplies saved the lives of the party. They were compelled to spend the winter here in a house which they erected, and in the following summer (1833) they went north to Lancaster Sound and fell in with a whaler, Ross's ship *Isabella* of 1818, on which they reached home. Only three men died during this prolonged and remarkable expedition. Ross was knighted, made C.B., and honored by many learned societies. In 1850 he participated in the search for Sir John Franklin (q.v.), in command of the yacht *Felix*. He was made rear admiral in 1851. His published works are: *A Narrative of a Second Voyage, Including the Reports of Commander James C. Ross and the Discovery of the Northern Magnetic Pole* (London, 1835); a treatise on steam navigation and many papers.

ROSS, John (1790–1866). A chief of the Cherokee nation and a determined champion of his people in the struggle which culminated in their removal to the West. He was born Oct. 3, 1790, at Rossville, Ga., not far from Chattanooga, of mixed blood, his father, Daniel Ross, having emigrated from Scotland before the Revolution and married a quarter-blood Cherokee woman, the daughter of John McDonald, also from Scotland. He was educated at Kingston, Tenn., and began his public career in 1809. In the Creek War of 1813–14 he served as adjutant of the Cherokee regiment which coöperated with General Jackson and took part in the battle of Horseshoe Bend. In 1817 he was elected to the national committee of the Cherokee Council, his first duty there being to reply to the United States commissioners, declining to negotiate for the sale of the Cherokee lands. In 1819, as president of the national committee, he was active in introducing schools, blacksmiths, and mechanics into the nation. In 1827 he presided over the convention which formulated a regular constitution for the government of the Cherokee nation and was elected assistant chief. In the next year (1828) he was made chief and held the position until his death in 1866.

ROSS, Ludwig (1806–59). A German archæologist, born at Altekoppel, Holstein. In 1832 he was appointed, by the Greek government, superintendent of the antiquities of the Peloponnesus (1833) and in 1837–43 was professor of archæology at the University of Athens. While in the latter post he explored the greater part of Greece, collected documents, and fixed the topography of various classical localities. In 1845 he became professor of archæology at Halle. His works include: *Reisen auf den griechischen Inseln des Aegäischen Meers* (1840–52); *Inscriptiones Græcæ Ineditæ* (1836); *Die Demen von Attika nach Inschriften* (1846); *Das Theseion und der Tempel des Ares zu Athen* (1852); *Archäologische Aufsätze* (1855–61); *Italiker und Gräken* (1858). Consult Otto Jahn, *Biographische Aufsätze* (Berlin, 1867).

ROSS, Martin. See Martin, Violet.

ROSS, Robert (c.1770–1814). A British soldier. He was born at Ross Trevor, Devonshire, and after graduating at Trinity College, Dublin, entered the British army and served in Holland and Egypt. At the beginning of the War of 1812 he was selected by the Duke of Wellington to command a brigade in America. After defeating the American troops at Bladensburg, he proceeded to Washington, where he set fire to the public buildings (August, 1814). This proceeding the English justified on the ground that Americans had burned the Canadian government buildings at York (Toronto). General Ross was killed at North Point, Md., while marching to Baltimore.

ROSS, Sir Ronald (1857–). A British physician, educated at St. Bartholomew's Hospital, London. In 1881 he entered the Indian medical service. In 1892 he undertook the verification of the mosquito theory of malaria. In 1897–98 he discovered the life history of malaria parasites in mosquitoes, and for this was awarded the Nobel prize for medicine in 1902. In 1899 an expedition to west Africa led by him found the malaria-bearing mosquito there. In the same year he retired from the Indian service with the rank of major. He was appointed professor of tropical sanitation in the University of Liverpool and Liverpool School of Tropical Medicine and in 1913 was made physician for tropical diseases at King's College Hospital, London. During the European War (1914 et seq.) he was consulting physician to the Indian troops. Ross became an editor of *Science Progress* and of the *Annals of Tropical Medicine*. He was elected F.R.S. in 1901 and created K.C.B. in 1911. His writ-

ings include: *Mosquito Brigades and how to Organize them* (1901); *Malarial Fever: Its Cause, Prevention, and Treatment* (9th ed., rev., 1902; Sp. trans., 1903); *The Prevention of Malaria* (1910), with others; and reports.

ROSS, Sir William Charles (1794–1860). An English miniature painter, born in London. After receiving instruction from his mother, Maria Ross, portrait painter, in 1808 he entered the schools of the Royal Academy. In 1814 he became assistant to Andrew Robertson, a miniature painter. Although at first ambitious to surpass in historical compositions, in time he devoted himself entirely to miniatures, securing a lucrative practice among the fashionable circles and royalty of Great Britain and Europe. In 1843 he was made Royal Academician and on June 1, 1842, was knighted by Queen Victoria. Ross executed over 2000 miniatures on ivory. They are good in line and refined in color, but marred by overcrowded composition and lack of simplicity in treatment of detail. Consult Williamson, *History of Portrait Miniatures* (London, 1904).

ROSS, The Man of. See Kyrle, John.

ROS'SA, O'Donovan (1831–1915). An Irish patriot, whose true name was Jeremiah O'Donovan. He was born at Ross Carbery, near Skibbereen, County Cork. In 1856 he became a member of the Phœnix Society, which a little later became a Fenian body with Rossa as captain. In 1858–59 he was imprisoned for a short time on a charge of sedition. In 1862 he fled to the United States, but in the following year was back in Dublin, where he joined the staff of the *Irish People*. The paper was suppressed in 1865 and Rossa was arrested, convicted on a charge of treason felony, and sentenced to prison for life. His sufferings made him a popular hero and he was returned to Parliament for County Tipperary in 1869. In 1870 he was liberated, but was banished for life. Going to the United States, he established the *United Irishman* in New York City about 1881. In 1885 he was shot by an English nurse, but soon recovered. Permitted to return in 1891, he lived in Ireland until 1900, when he again went to America. Fervent advocacy of violent methods earned him the name of Dynamite Rossa. He was buried in Dublin.

ROSS AND CROM'ARTY. A northern county of Scotland (Map: Scotland, C 2). The greater part of the island of Lewis, with Harris, belongs to this county. Area, 3078 square miles. Ross and Cromarty in many parts presents a wild and mountainous aspect. The high grounds afford excellent pasture for sheep and cattle, and the glens, in the more favored portions, are generally fertile, producing grain of a superior quality. The fisheries are important. The principal loch is Maree (insignificant). Chief towns, Cromarty, Dingwall (the county town), Tain, and Stornoway. Pop., 1901, 76,400; 1911, 77,364.

ROSSANO, rôs-sä'nō. A city in the Province of Cosenza, Italy, situated on a foothill of the Apennines, near the Gulf of Taranto, 28 miles northeast of Cosenza (Map: Italy, F 5). It is walled, well built, and defended by a castle. The city has a Byzantine cathedral and an archiepiscopal library with a valuable manuscript of the Gospels. Alabaster and marble are quarried and there are manufactures of silk and olive oil. Pop. (commune), 1901, 13,555; 1911, 13,354.

ROSSBACH, rös'bäg. A village in Prussian Saxony, 9 miles southwest of Merseburg. It is celebrated for the victory gained here in 1757 by the Prussians under Frederick the Great over the combined French and Imperialist armies. The victory of Rossbach was important for the moral strength it brought to the Prussian cause at a time when its fortunes were at the lowest. Consult Von der Goltz, *Rossbach und Jena* (Berlin, 1883).

ROSSBACH, August (1823–98). A German classical scholar, born in Schmalkalden and educated at Leipzig and Marburg. He was appointed professor in 1854 at Tübingen and in 1856 went to Breslau as professor of philology and archæology. He edited Catullus (1854; 2d ed., 1860) and Tibullus (1854) and wrote on Roman marriage, *Römische Hochzeits- und Ehedenkmäler* (1871); but it is with Greek metrics that his name is most closely connected because of his coöperation with Westphal on *Metrik der griechischen Dramatiker und Lyriker* (1854–65; 3d ed., as *Theorie der musischen Künste der Hellenen*, 1885–89). Consult J. E. Sandys, *A History of Classical Scholarship*, vol. iii (Cambridge, 1908).

ROSSBACH, Otto (1858–). A German classical scholar, son of August Rossbach. He was born in Breslau, studied there, at Jena, at Rostock, and at Berlin, where in 1884 he became assistant in the anthropological museum, was professor at Kiel from 1890 to 1895, and then was appointed to a chair of archæology in the University of Königsberg and to the post of instructor in the Academy of Art. He wrote: *De Senecæ Philosophi Recensione* (1886); *Griechische Antiken des archäologischen Museums in Breslau* (1889); an edition of Florus (1896); an edition of the *Periochæ* of Livy (1910); *Castro Giovanni, das alte Henna in Sicilien* (1912); and many contributions on mythology, art, and literature to the Pauly-Wissowa *Real-Encyklopädie*. In 1900 he published a memoir of his father (2d ed., 1907).

ROSSE, rös, William Parsons, third Earl of (1800–67). An English astronomer, born in York. He was educated first at Trinity College, Dublin, and afterward at Magdalen College, Oxford, where he graduated first-class in mathematics in 1822. He was elected to Parliament as member for King's County while still at Oxford and sat for that constituency from 1821 to 1834. In 1843 he was president of the British Association and from 1849 to 1854 president of the Royal Society. In 1862 he was elected vice chancellor of Dublin University. At an early age Rosse devoted much attention to the study of practical science and especially to the problem of the best mode of constructing the speculum of the reflecting telescope. By a long series of carefully conducted experiments he succeeded in discovering a method by which the cracking and warping of the surface on cooling were wholly obviated and the defects of spherical aberration and absorption of light by the speculum were greatly diminished. In 1842 his experiments culminated in the casting of a giant speculum 6 feet in diameter and 54 feet in focal length, which was finally mounted in his park at Birr Castle, Parsonstown, in 1845. (See Telescope.) The first addition to astronomical knowledge made by this telescope was the resolution of certain nebulæ, which had defied Herschel's instrument, into groups of stars; next came the discovery of numerous

binary and triple stars. The telescope itself is now dismounted; and experience has shown that metal reflectors cannot be made permanently useful on account of the rapid tarnishing of the polished surfaces.

ROSSELLI, rôs-sĕl'lē, COSIMO DI LORENZO FILIPPI (1439–1507). A Florentine painter of the Renaissance. He was the pupil and assistant of Neri di Bicci (1419–91) and was influenced by Benozzo Gozzoli and Baldovinetti. In 1480, with other prominent artists, he was called to Rome by Pope Sixtus IV to assist in decorating the Sistine Chapel, where he painted "The Tables of the Law," "Christ Preaching from the Lake," and "The Last Supper" (1482). Among his more numerous works in Florence are "The Coronation of the Virgin" (Santa Maria Maddalena dei Pazzi), "The Miraculous Chalice" (Sant' Ambrogio), and the "Adoration of the Magi" (Uffizi Gallery), all containing many portraits. There are also examples of his art in many German galleries and in London, Paris, and the Johnson collection, Philadelphia. Rosselli is a pleasing chronicler and a good craftsman, but lacks originality and force, is rather archaic in manner, and overcrowds his pictures with detail. His most important pupils were Piero di Cosimo and Albertinelli.

ROSSELLINI, rôs'sĕl-lē'nē, THE. A surname applied to two early Renaissance sculptors and architects of Florence, ANTONIO and BERNARDO DI MATTEO DI DOMENICO GAMBARELLI (1427–c.78 and 1409–64). They were the youngest and eldest respectively of five brothers Gambarelli, who conducted a flourishing workshop in Florence. Bernardo was the pupil of Alberti and was influenced by Donatello. His tomb of Leonardo Bruni (Aretino) in Santa Croce (1444) is his best work in sculpture and the prototype of the fifteenth-century Florentine niche tombs. The recumbent figure is called by Bode the noblest effigy in Italy, after Donatello's Pope John XXIII. Bernardo never attained complete freedom of form and lacked animation, but his peculiar charm is well exemplified in a marble "Annunciation" in the Misericordia at Empoli and a tabernacle in Santa Maria Nuova, Florence. Other works in sculpture are the tombs of Beata Villana (1451) in Santa Maria Novella and of Filippo Lazzari in San Domenico of Pistoia (with his brother). It was in architecture, however, that Bernardo made his fame. Under the popes Nicholas V and Pius II he was employed in many of the chief works of the day. He planned extensive changes in the Vatican and made designs for St. Peter's which were afterward used and changed by Bramante. The Piccolomini palaces at Siena (finished 1498) and Pienza (1462) are also attributed to him, as well as other buildings in the last-named town, the fortifications of Civitâ, Castellana, Narni, Orvieto, Spoleto, and restorations of numerous churches in Rome and elsewhere.

ANTONIO was the pupil of his brother Bernardo. Nothing is known of his youth. His earliest authentic work is the "St. Sebastian's Altar" in the Pieve at Empoli (1457), the figure of the saint being one of the finest nude statues of the fifteenth century. His masterpiece is the chapel and monument of the Cardinal of Portugal in San Miniato, Florence (1461–66), which admirably displays the delicate modeling, naïve tender sentiment, vivacity of expression and movement, masterly treatment of drapery, and exquisite taste in the arrangement of ornament and detail, which are the chief characteristics of Antonio's art. He made a slightly altered reproduction of this tomb for the wife of Antonio Piccolomini in Monte Oliveto, Naples, where is also a fine marble altar by him. Other important works include a terra-cotta group of the "Nativity," in the Metropolitan Museum, New York; three reliefs in the cathedral at Prato (1473); many reliefs of the "Madonna and Child," notably one in the Altman collection, Metropolitan Museum; some charming busts of children, and the admirable bust of the physician Giovanni di San Miniato, in the South Kensington Museum. Consult: Geymüller Stegmann, *Die Architektur der Renaissance in Toscana* (Florence, 1885–96); Wilhelm Bode, *Denkmäler der Renaissance Sculptur Toscanas* (Munich, 1892–1905); Giorgio Vasari, *Lives of the Most Eminent Painters, Sculptors, and Architects*, vol. ii, edited by Blashfield and Hopkins (New York, 1896).

ROSELLY DE LORGUES, rô'z'-lĕ' de lôrg, ANTOINE FRANÇOIS FÉLIX (1805–98). A French religious author, born at Grasse. He studied law at Aix, but gave up his practice to devote himself to literature. His chief publications are: *Christophe Colomb* (1856); *Christophe Colomb le serviteur de Dieu* (1884); *Satan contre Colomb* (1876); *Histoire posthume de Colomb* (1885). The author's claim in this last book that Columbus was directly inspired by God in his voyages, and that therefore he should be canonized by the Church, led to Roselly's being commissioned by the Queen Regent of Spain to present the matter to the Pope.

ROS'SER, THOMAS LAFAYETTE (1836–1910). An American soldier and civil engineer, born in Campbell Co., Va., and reared in Texas. He entered West Point in 1856, but resigned in 1861, before graduating, to enter the artillery of the Confederate army. After a year's service in this branch he was transferred to Stuart's cavalry, and soon afterward was promoted to be brigadier general in command of the Laurel Brigade. Rosser became major general in 1864, and in 1865 refused to surrender with Lee, but made his escape and attempted to reorganize the Confederate forces in northern Virginia. He was captured, and after his release studied law. In 1871 he was appointed chief engineer of the Eastern Division of the Northern Pacific. As chief engineer of the Canadian Pacific (1881–86) he built most of the line west of Winnipeg; and in 1886 retired to Virginia. During the war with Spain Rosser served as brigadier general of United States volunteers.

ROSSETTI, rô-sĕt'ē, CHRISTINA GEORGINA (1830–94). An English poet, younger daughter of Gabriele Rossetti and sister of Dante Gabriel Rossetti. She was born in London and was educated at home under the care of her mother. After a life of devotion and retirement she died Dec. 29, 1894. The poetic impulse manifested itself early. She addressed a poem to her mother on the latter's birthday, April 27, 1842, sent two poems to the *Athenæum* in 1848, and contributed, under the pseudonym Ellen Alleyne, several beautiful lyrics to the *Germ* (1850). Her published volumes of poems comprise mainly: *Verses* (privately printed, 1847); *Goblin Market, and Other Poems* (1862); *The Prince's Progress, and Other Poems* (1866); *A Pageant, and Other Poems* (1881); *Poems*, new and enlarged edition (1891); *Verses* (1893); *New Poems* (posthumous, 1896). She also wrote

many devotional pieces in prose, which circulated widely. As a poet Christina Rossetti ranks high; her only equal among the English women of the nineteenth century was Mrs. Browning. She is seen at her very best in her short and intense lyrics like "After Death" and "Passing and Glassing." Consult: E. W. Gosse, *Critical Kit-Kats* (New York, 1896); Mackenzie Bell, *Christina Rossetti: A Biographical and Critical Study* (London, 1898); *Poems* (Boston, 1899); P. E. More, *Shelburne Essays* (3d series, New York, 1905). Her sister, MARIA FRANCESCA (1827–76), was also a remarkable woman. She is known for her admirable *A Shadow of Dante* (1871).

ROSSETTI, DANTE GABRIEL (1828–82). A famous English poet and painter, the principal founder of the Pre-Raphaelite Brotherhood. (See PRE-RAPHAELITES.) He was born in London, May 12, 1828, the eldest son of Gabriele Rossetti (q.v.). The literary and artistic environment in which he was brought up was stimulating to the boy's precocious powers, and at the age of six he had begun to compose dramatic scenes. After spending five years at King's College School and studying in Cary's art academy and in the Royal Academy, at 20 he became a pupil of Ford Madox Brown, whose influence had much to do with his development. With Holman Hunt, Millais, and others Rossetti worked towards the revival of the detailed elaboration and mystical interpretation that characterized Pre-Raphaelite art. In 1860 he married Elizabeth Eleanor Siddal, whose peculiar type of beauty he has immortalized in many of his best-known pictures. She died two years later, and Rossetti never recovered from the shock. In addition to this grief he was much troubled by a bitter attack made (in 1871) upon the morality of his poems, in an article entitled "The Fleshly School of Poetry." This was written by Robert Buchanan, whose identity, veiled under the pseudonym of Thomas Maitland, was not revealed until some time afterward. The charge was vigorously rebutted by Swinburne and by Rossetti himself under the title "The Stealthy School of Criticism." His mental depression brought on, by 1868, chronic insomnia, for which he sought to find relief in chloral. The drug obtained an unhappy mastery over him, which threw a tragical gloom upon his later years, relieved only by the creative play of his mind, which continued almost to the last to produce pictures and poems of singular beauty. He died at Birchington, April 10, 1882.

It is hard to say whether Rossetti deserves a more lasting place in the history of poetry or in that of painting. At 20 he wrote a remarkable poem, which, perhaps better than any other, illustrates the Pre-Raphaelite movement on its literary side—"The Blessed Damozel"; the combination of simplicity and concreteness with lofty spirituality, which makes it typical of the aims of the school both in literature and art, appears also in another of his early poems, "My Sister's Sleep." The great bulk of his poetry was not published until 1870. In despair at the death of his wife he placed in her coffin all his unpublished writings, and there they remained buried until at the urgent request of his friends he consented to have them exhumed. This volume, another of *Ballads and Sonnets* (1881), and a series of translations from early Italian poets, *Dante and his Circle* (1874), contain the whole of his poetical accomplishment. His only imaginative work in prose was the delicate and spiritual story, *Hand and Soul* (1850). He made several attempts in ballad form, two of which, "Sister Helen" and "The King's Tragedy," are especially remarkable; the latter illustrates his dramatic power at its highest. A special place must be accorded to his great sonnet sequence, "The House of Life," which in its final form contains 101 magnificent sonnets inspired chiefly by the love and the loss of his wife. In them the language and imagery grew much more elaborate than in his earlier work. His poetry as a whole has been called painter's poetry, from its constant appeal to the eye, making it "a kind of poetical tapestry, stiff with emblazoned images." Picturesqueness and visual beauty are its most salient characteristics.

His paintings fall readily into three periods. There are, first, the small biblical pictures of which "Ecce Ancilla Domini" (Tate Gallery) and the "Girlhood of Mary Virgin" are best known. Second, the Dante pictures, in which there is a brilliant imaginative romanticism, the most important being "Giotto Painting the Portrait of Dante," "The Salutation of Beatrice on Earth and in Eden," "La Pia," "Beata Beatrix" (Tate Gallery, London), and "Dante's Dream" (Walker Art Gallery, Liverpool). "La Donna della Finestra" (1879) is counted among his ripest creations, but "Dante's Dream" perhaps shows the painter at his zenith. Other good examples are "Borgia Family" (South Kensington Museum) and "Lady Lilith" (Metropolitan Museum, New York). Rossetti's wife sat for many of this series. The third period was occupied almost exclusively with the painting of the soul, when he painted feminine figures furnished with poetic attributes, the deeper meanings of which he interpreted in his poems. Among these pictures the "Sphinx" alone contains several figures. "The Blessed Damozel," "Fiammetta," "The Day Dream" (South Kensington Museum), "Astarte Syriaca" (Manchester Art Gallery), "Monna Pomona" (Tate Gallery), and others are separate figures dedicated to the memory of his wife. Rossetti's tall Gothic figures are motionless and silent, and are eloquent only through their spiritual hands and dreamy eyes. At first glance there seems to be only one type, but in reality there was variation, Mrs. William Morris, in especial, inspiring his later productions. He drapes his figures in Venetian fashion and strews flowers about them, especially roses and hyacinths. Rossetti as a painter was not particular about details and was often awkward in line, but in color he was clearly the best of the Pre-Raphaelite group. He painted as he wrote, in a mystical, romantic spirit. Many of his pictures are scattered in English country houses and in private collections in Florence and in America.

Bibliography. Rossetti's collected works were published in 1886 by his brother, William Michael Rossetti (q.v.), who also published the following volumes relative to D. G. Rossetti: *Dante G. Rossetti as Designer and Writer* (1889); *Family Letters and Memoir* (1895); *Ruskin, Rossetti, Pre-Raphaelitism* (1899); *Pre-Raphaelite Diaries and Letters* (1900); *Rossetti Papers, 1862–70* (1903); *Bibliography of the Works of D. G. Rossetti* (1905). Among many monographs are those by William Sharp (London, 1882); J. Knight (ib., 1887); H. C. Marillier (ib., 1901), the most detailed and complete

monograph; Helen Rossetti, in *Art Annual* (ib., 1902); E. Radford (ib., 1905); Jarno Jesson (Bielefeld, 1905); H. W. Singer (New York, 1906); A. C. Benson (London, 1906); Frank Rutter (ib., 1908); Arthur Symons, in *International Art Series* (New York, 1909); F. M. Hueffer (ib., 1902). Consult also: Hall Caine, *Recollections of Dante Gabriel Rossetti* (London, 1882); Tirebuck, *Rossetti: His Work and Influence* (ib., 1882); W. Allingham, *Letters of D. G. Rossetti to William Allingham, 1854–70* (ib., 1897); E. L. Cary, *The Rossettis* (ib., 1900); and essays by A. C. Swinburne, in *Essays and Studies* (London, 1875); Walter Pater, in *Ward's English Poets* (ib., 1883); Gabriel Sarrazin, in *Poètes modernes de l'Angleterre* (Paris, 1885). See also bibliography of PRE-RAPHAELITES.

ROSSETTI, GABRIELE (1783–1854). An Italian author, born at Vasto. He at first dedicated himself to painting, but renounced this career to devote himself to letters. In 1814 Murat made him Secretary of Instruction and the Fine Arts. As a member of the secret society of the Carbonari, Rossetti had a hand in the Napoleonic revolution of 1820, and in his beautiful ode "Sei pur bella" he appeared as the poet of this movement. When King Ferdinand returned to power he had to take refuge aboard an English vessel. After a couple of years in Malta he went in 1824 to London, where in 1831 he was appointed to a post in King's College. He was an enthusiastic student of the work of Dante and in a fantastic interpretation of the *Divine Comedy, Commento analitico sulla Divina Commedia* (London, 1826) advocated the reform of the Church, while in his verse, springing from a politico-religious idealism imbued with mysticism, he followed the vicissitudes of Italy and the other European nations until 1848. His *Iddio e l'uomo salterio* appeared in 1840, his *Veggente in solitudine* in 1846, and his *Arpa evangelica* in 1852. He became blind in 1845. Three of his children were prominent in English art and letters of the nineteenth century—Dante Gabriel, Christina Georgina, and William Michael Rossetti (qq.v.), the last named of whom translated his father's autobiography in 1901. Consult, besides, Carducci's edition (with a preface) of the *Poesie di Gabriele Rossetti* (Florence, 1861); G. Perale, *L' opera di Gabriele Rossetti* (Città di Castello, 1906); and a Rossettian bibliography by D. Ciampoli, in G. Rossetti, *La vita mia* (new ed., Lanciano, 1910; Eng. trans. by W. M. Rossetti, 1901).

ROSSETTI, WILLIAM MICHAEL (1829–1919). An English critic and biographer, brother of Dante Gabriel Rossetti. He was born in London and from King's College School entered the excise office in 1845, became assistant secretary there in 1869, and was retired in 1894. His wife, a daughter of Ford Madox Brown (q.v.) and herself an author and painter, died in 1894. He was closely connected with the Pre-Raphaelite Brotherhood, beginning in 1848, and was editor of its organ, the *Germ*. He published a version of Dante's *Inferno* (1865) and *Dante and his Convito* (1910), also *Fine Art* (1867), but his popular repute is as an editor of poetry and as a biographer. For his writings and editorial work relative to his brother and to Pre-Raphaelitism, see the bibliography of ROSSETTI, DANTE GABRIEL. His publications include, further: *Lives of Famous Poets* (1878); *Life of Keats* (1887); *Poems of Christina Rossetti* (1896); *Memoirs of Gabriele Rossetti* (1901), a translation of his father's autobiography; *Some Reminiscences* (1906).

ROSSI, rôs'sē, AZARIAH DEI (c.1514–78). An Italian Hebraist, born in Mantua. In 1574–75 he published his great work *Me'or 'ēnayim* (The Light of the Eyes), of which the first part deals with the earthquake of Ferrara in 1571 and of natural phenomena in general, the second narrates the origin of the translation of the Greek Septuagint, the history of the Jews in Alexandria and Cyrene, and the insurrection of Bar-Kokba, and the third deals with literary and historical criticism, for the most part in a very radical manner. Rossi answered orthodox attacks in *Mazref ha Kesef* (The Refining Pot for Silver) (reprinted with the *Me'or 'ēnayim* by Zunz at Vilna, 1863–66).

ROSSI, ERNESTO (1829–96). An Italian actor. He was born at Leghorn and studied law at the University of Pisa. Subsequently he entered a dramatic school, and after having appeared in various Italian cities, went in 1855 with Madame Ristori to Paris. He acted there and later in Vienna with great success, and then returned to Italy and founded a dramatic company. He appeared again in Paris in 1866 in *Le Cid* on the occasion of the anniversary of Corneille. Having visited Spain, Portugal, and South America, he returned to Paris in 1875 and gave a series of Shakespearean representations. He also played successfully in London and in the United States (1881) in Shakespearean characters. Consult his *Quarant' anni di vita artistica* (Florence, 1887–89). He was the author also of *Studj drammatici* (1882) and of a few plays. His brother, CESARE ROSSI (1828–98), was a noted comedian.

ROSSI, GIOVANNI BATTISTA DE (1822–94). An Italian archæologist, best known for his contributions to Christian antiquities. He was born in Rome, studied in the Collegio Romano and at the Sapienza, and then received the post of scriptor in the Vatican Archives, where he was long engaged in cataloguing manuscripts. The work for which he is most famous is the study of the catacombs (q.v.). Not only did he map their windings, but he made the important discovery of the cemetery of St. Calixtus, with its papal tombs from the third Christian century. Rossi saw the great importance of literature in connection with epigraphy, and for the history of the catacombs utilized martyrologies, calendars, and mediæval itineraries. In this, his great work, he was largely assisted by his brother, Michele de Rossi. Supplementing the *Roma sotteranea cristiana* (1864–77) were the *Musaici cristiani e saggi di pavimenti delle chiese di Roma* (1872–96) and the *Inscriptiones Christianæ Urbis Romæ Septimo Sæculo Antiquiores* (1857–88). Apart from his work on Christian archæology, which was the main topic of the *Bolletino di archeologia* (1863–94, edited and almost entirely written by him), he was an able epigraphist. The Berlin Academy appointed Rossi, Mommsen, and Henzen a commission for the publication of the *Corpus Inscriptionum Latinarum* (1863 et seq.). With Henzen he edited the sixth volume of the *Corpus*, the non-Christian *Inscriptiones Urbis Romæ Latinæ* (1876–94).

ROSSI, PELLEGRINO, COUNT (1787–1848). An Italian jurist and statesman, born in Carrara. He studied at Pisa and Bologna and became

professor of law at the latter university in 1812. In 1815 he sided with Murat, and upon his fall took refuge at Geneva, where he was appointed professor of criminal law (1819) and published *Le droit pénal* (1829), a very learned work. In 1833 Louis Philippe called him to Paris and appointed him professor of political economy in the Collège de France. He there wrote his treatise *Du droit constitutionnel*, in recognition of which he was made a member of the Chamber of Peers (1839). Rossi was sent to Rome as Ambassador in 1845. There he became once more an Italian subject after the fall of Louis Philippe (1848), being elected from Bologna to the Roman Chamber. On Sept. 14, 1848, he was intrusted by Pius IX with the formation of a ministry. He opposed the house of Savoy and planned an alliance with the King of Naples, which had for its object an Italian confederation under the papal presidency. The resulting unpopularity of Rossi probably led to his assassination, Nov. 15, 1848. Rossi also published the *Cours d'économie politique* (1840) and other works. He also left many unedited writings. Consult D'Ideville, *Le comte Pellegrino Rossi: sa vie, son œuvre, sa mort, 1787–1848* (Paris, 1887).

ROSSINI, rôs-sē'nē, Gioachino Antonio (1792–1868). A famous Italian composer, born at Pesaro. At the age of 15 he was sent by the Countess Perticari to the Lyceum of Bologna. His first opera was composed in 1810 under the title of *La Cambiale di Matrimonio*, and met with moderate success. Within the next two years he had written eight operas, all of them poor and short-lived. *Tancredi*, his first important work, was performed in 1813 at Venice, and placed its composer at once in the front rank. Next came *L' Italiana in Algeri* (1813), *Il Turco in Italia* (1814), and *Aureliano in Palmira* (1814), each of them inferior to *Tancredi*. In 1815 he was appointed musical director of the theatre of San Carlo at Naples. *Il Barbiere di Siviglia*, one of the imperishable masterpieces of *opera buffa*, is said to have been composed in 20 days; it was first produced in 1816 at Rome. *Otello* followed in 1817, as also did *La Cenerentola* at Rome and *La Gazza Ladra* at Naples. Before the close of his engagement at Naples (1823) he wrote *Mosè in Egitto*, *La Donna del Lago*, *Maometto Secondo*, and *Zelmira*. In 1823 *Semiramide* was performed in Venice, after which Rossini went to Paris and was given the directorship of the Italian opera, one of the most coveted prizes in the musical world; but his constitutional indolence unfitted him for this position. In 1829 *Guillaume Tell*, his most serious effort, was produced. In 1836 he returned to Italy, where, with the exception of a visit to Paris, he principally resided till 1855. With *Guillaume Tell* Rossini's career may be said to have closed. After that, during a period of 38 years, he wrote only his famous *Stabat Mater* (1832; enlarged, 1841) and a little church music. Rossini was undoubtedly the greatest lyrical composer of that school of Italian opera which is known as the school of *bel canto*. His music is marked by stirring melody, brilliant effects, and spontaneous vivacity. Of his 40 operas *Il Barbiere di Siviglia* is the only one that still is in the repertory of every opera house. Consult: H. S. Edwards, *The Life of Rossini* (Boston, 1881); J. Sittard, *Rossini* (Leipzig, 1882); W. A. Bevan, *Rossini* (New York, 1905); L. Dauriac, *Rossini* (Paris, 1905); E. Corradi, *Gioachino Rossini* (Rome, 1909).

ROS'SITER, Thomas Prichard (1817–71). An American portrait and historical painter. He was born in New Haven, Conn., and studied there with Nathaniel Jocelyn. In 1838–40 he painted portraits in London and Paris and from 1841 to 1846 he lived in Rome. In 1849 he was elected to the National Academy and he had a studio in Paris from 1853 to 1856, winning a gold medal at the Universal Exposition of 1855 for his "Venice in the Fifteenth Century." Among his best-known paintings are: "Jews in Captivity"; "The Wise and Foolish Virgins"; "The Home of Washington" (1858), painted together with Mignot; "Washington's First Cabinet"; "The Last Hours of Tasso"; and a series of pictures illustrating the life of Christ. Though popular in its day his work is of little artistic merit.

ROSS'LAND. A city in the Kootenay district of British Columbia, Canada, 6 miles from the international boundary line, on the Canadian Pacific and the Canadian Northern railroads (Map: British Columbia, E 5). At first it developed rapidly, owing to rich mineral deposits, but afterward declined. It is still the centre of the gold-copper mining district of West Kootenay. It has saw mills and bottling works. Pop., 1901, 6159; 1911, 2086.

ROSSLAU, rôs'lou. A manufacturing town of the Duchy of Anhalt, Germany, 4 miles by rail north of Dessau, on the right bank of the Elbe. Chemicals, sealing wax, paper, machinery, wire goods, sugar, and bricks are manufactured. Pop., 1900, 10,054; 1910, 11,306.

ROSSLYN, rôs'lin. See Roslin.

ROSSLYN, Alexander Wedderburn, first Earl of (1733–1805). A British statesman, born at East Lothian. He attended Edinburgh University and was a Scottish advocate from 1754 to 1757, when he was called to the English bar. Through the influence of Lord Bute he became a member of Parliament in 1761 and continued to hold a seat until 1778. Later he became an adherent of George Grenville in politics, but made speeches in 1769 in favor of John Wilkes (q.v.) and attacked Lord North's administration in 1770. His return to the Tories and acceptance of the solicitor-generalship in 1771 were generally considered by his former friends evidence of treachery. In 1778 he was promoted to Attorney-General and in 1780 was made Chief Justice of Common Pleas and created Baron Loughborough. From 1793 to 1801, when he was created Earl of Rosslyn, he held the lord-chancellorship.

ROSTAND, rô'stäN', Edmond (1868–1918). A French dramatist, the son of Eugène Rostand. He was born in Marseilles, April 1, 1868. Early in his career he went to Paris. His first drama, *Les romanesques* (acted 1894, published 1899), was a success in the rococo style, followed by *La princesse lointaine* (1896, published 1899) and *La Samaritaine* (1897, published 1898), mystic and Pre-Raphaelite. All these showed a preciosity of diction and a talent for supple and sinuous verse. They gave, however, little promise of the joyous brilliancy of *Cyrano de Bergerac* (1897), a success on two continents and pronounced by Faguet "the finest dramatic poem of half a century." Perhaps soberer judgment may pronounce it charming rather than strong. This play was founded on the life of an actual personage. (See Bergerac, Savinien Cyrano

DE.) Richard Mansfield was notable as Cyrano, a rôle which had been created by Coquelin. *L'Aiglon* (1900) has for its central figure and ineffectual hero the unhappy Duke of Reichstadt, "Napoleon II." If, as is asserted, Rostand's first work is *La Samaritaine*, he began his dramatic development as a disciple of Tolstoy and Maeterlinck, Rossetti and Verlaine. *Les romanesques* is more like the comedies of Musset, "brilliant stuff," as Lemaître has called it, "sparkling with wit and glowing in places with a large and easy gaiety." *La princesse lointaine* has its scene also in Utopia, here called Tripoli, and in "any period, so that the costume be pretty." The subject, the love of the troubadour prince Jaufré Rudel for the fair Mélisande, which had attracted Heine, Browning, and Swinburne, produces a result more beautiful as a poem than *Cyrano* or *L'Aiglon*, but less dramatically effective in presentation. In 1910 the long-delayed *Chantecler* was given with Guitry in the title part. Rostand had written the play for Coquelin, but this great actor died before its completion. There are beautiful lyric passages in *Chantecler*, but it lacks dramatic movement. In stage presentation, too, there was something more ludicrous than poetically symbolic in the conversations of barnyard fowls. The title rôle of *Chantecler* was played in English by Maude Adams, and the transplantation was a greater failure than the original French production. *L'Aiglon*, which Miss Adams had interpreted some years before, was more successful. Besides these dramas, Rostand, who called himself "the poet of preciosity," wrote *La journée d'une précieuse*, which shows a member of the Hôtel de Rambouillet (q.v.) circle occupied with the innocent artifices of a fashionable bluestocking. Rostand was elected a member of the French Academy in 1901. In English translation appeared: *Cyrano de Bergerac* (1898); *La princesse Lointaine* (1899); *The Romancers* (1899); *L'Aiglon* (1900); *Chantecler* (1910). For Rostand's wife, see ROSTAND, ROSEMONDE GÉRARD.

Bibliography. Filon, *De Dumas à Rostand* (Paris, 1898); *L'Illustration* (ib., 1898, 1910); the *Edinburgh Review* (Edinburgh, October, 1900); G. K. Chesterton, *Varied Types* (New York, 1903); E. E. Hale, Jr., *Dramatists of To-Day* (6th ed., ib., 1911); Ludwig Lewisohn, *The Modern Drama* (ib., 1915).

ROSTAND, ROSEMONDE GÉRARD (?–). A French poet and dramatist, wife of Edmond Rostand and granddaughter of Marshal Count Gérard (qq.v.). She was well known before her marriage (as the author of *Les pipeaux*) and continued to write under her maiden name. In 1913, in collaboration with her son Maurice, she wrote *Un bon petit diable*, based upon the story of the Comtesse de Ségur. This was translated as *A Good Little Devil* and produced by Belasco in New York City. In 1914 mother and son wrote *La petite vendeuse d'allumettes*, based upon the Hans Andersen and Grimm fairy tales. Both the plays are idealistic in feeling and are written in beautiful lyric verse, but they lack dramatic qualities.

ROSTOCK, rŏs'tŏk. A seaport and the most important city of Mecklenburg-Schwerin, Germany, situated on the estuary of the Warnow, 9 miles from its mouth and 80 miles east-northeast of Lübeck (Map: Germany, E 1). The town retains its mediæval aspect. Of its squares the finest is the Blücherplatz, with a bronze statue of Blücher, who was born here. The market place contains the town hall, a thirteenth-century Gothic structure. The twelfth-century St. Peter's Church has a tower 427 feet high. There is a fine ducal palace. The new university building was erected in 1867–70. The university has faculties of theology, jurisprudence, medicine, and philosophy and had 985 students in 1913. The university library has 285,000 volumes. There is a school of navigation. The city is one of the principal Baltic ports, the exports being chiefly live stock, grain, wool, and flax. Among the manufactures are machinery, woolens, tobacco, sugar, chocolate, carriages, and chemicals. Shipbuilding is carried on. There are also important wool, horse, and cattle markets. Pop., 1900, 54,713; 1910, 65,377. Rostock was a member until 1630 of the Hanseatic League and long ranked next to Lübeck among the Baltic cities. The university was founded in 1419. Consult Koppen, *Geschichte der Stadt Rostock* (Rostock, 1887).

ROSTOPTCHIN, or **RASTOPTCHIN,** rŏs-tŏp'chĭn, FEODOR VASILIEVITCH, COUNT (1763–1826). A Russian general, born in the Government of Orel. He was a court page of Catharine II and then entered the army as lieutenant in the Imperial Guard. Paul I made him a general in 1796 and soon after grand marshal of the court, Minister of Foreign Affairs, and Count (1799). Under Alexander I Rostoptchin remained in banishment till May, 1812, when he was appointed Governor-General of Moscow. On the approach of the French in that year Rostoptchin raised an army of 120,000 men fully equipped, but to his great chagrin was ordered to evacuate Moscow. He was held to have caused the burning of Moscow, but in 1823 he published in his own defense *La vérité sur l'incendie de Moscou* (Paris, 1823), in which he declared that this action was due in part to the fervid patriotism of a few of the inhabitants and in part to the violence and negligence of the French. It is known, however, that Rostoptchin set fire to his own house near Moscow, and that his example was followed by many others, thus making him virtually responsible for the conflagration. In 1814 he was dismissed from office. Consult Ségur, *Vie du comte Rostopchine* (Paris, 1872).

ROSTOV, rŏs-tŏf'. One of the oldest towns of Russia, situated in the Government of Yaroslav, on Lake Nero, about 35 miles south of Yaroslav (Map: Russia, E 3). The great landmark of this town is the Kremlin, which, with the exception of that of Moscow, is the best preserved and most interesting in Russia. It is situated on a slight eminence in the centre of the town, and is surrounded by a wall 1½ miles in circumference, with numerous battlements and towers of huge dimensions. Inside the Kremlin are situated the thirteenth-century Uspensky Cathedral, with relics of many saints, the *white palata* used for court receptions by the princes of Rostov, now containing a fine collection of Church antiquities, and the old residence or *terem* of the princes, dating from the fifteenth century. The monasteries of the town and the vicinity are also of great archæological importance and attract many pilgrims. Commercially Rostov is of slight importance. The manufacture of icons or holy pictures is an important industry. The town has several educational institutions and a historical museum. The mediæval Principality of Rostov embraced,

besides the present Government of Yaroslav, portions of the governments of Tver, Vologda, Novgorod, and Kostroma. It attained considerable importance, and its capital was known as Rostov the Great. The invasion of the Mongols weakened it greatly, and it was finally annexed to Moscow by Dmitry Donsky (1363–89). Pop., 1897, 13,016; 1910, 18,250.

ROSTOV-ON-THE-DON. One of the principal commercial centres of south Russia, situated at the head of the Don delta, about 40 miles from the Sea of Azov and at the convergence of three important railway lines (Map: Russia, E 5). The town contains large grain storehouses and extensive flour mills, iron works, distilleries, tobacco factories, and saw mills. The total value of its manufactures exceeds $10,000,000 per annum. Rostov is the centre of the grain trade of southeast Russia. Its chief exports are wheat, rye, barley, and wool. The imports in 1913 amounted to 5238 tons and were valued at over $2,000,000. It has a museum, a public garden, and two important cathedrals, the Greek Catholic Cathedral and the cathedral of St. Alexander Nevsky, the latter completed in 1908. The fairs of Rostov are notable. The educational institutions include a school of navigation and a railway school. Rostov dates from 1731. It is well situated and is the best-built town in south Russia after Odessa and Kiev (qq.v.). Pop., 1910, 172,275, including a considerable proportion of foreigners.

ROSTOVSKI, Alexei Borisovitch Lobanov-. See Lobanov-Rostovski, A. B.

ROS'TRA (Lat., beaks). In ancient Rome, the name applied to a great open-air platform of masonry, from which public speakers addressed the people. The rostra received its name in 338 B.C., when Mænius was victorious at Antium (q.v.) and the beaks (*rostra*) of some of the ships captured in the fight were fastened to a platform already erected in the Comitium (q.v.), facing the Forum (q.v.). Julius Cæsar in 44 B.C. planned to remove the rostra to the west end of the Forum. Augustus made the actual transfer. The rostra underwent various reconstructions and changes in later times. Consult Christian Hülsen, *The Roman Forum* (Eng. trans. by J. B. Carter, 2d ed., Rome, 1909), and S. B. Platner, *The Topography and Monuments of Ancient Rome* (2d ed., Boston, 1911).

ROSWELL, rŏz'wĕl. A city and the county seat of Chaves Co., N. Mex., 170 miles northeast of El Paso, Tex., direct, on the Pecos River and on the Atchison, Topeka, and Santa Fe Railway (Map: New Mexico, E 5). There are in the city the New Mexico Military Institute, St. Mary's Hospital, a Carnegie library, and fine Federal buildings and courthouse. The city is engaged chiefly in farming and cattle and sheep raising. Roswell became a city in 1904 and has adopted the city-manager plan of government. Pop., 1900, 2049; 1910, 6172.

ROSWITHA, rŏs'vē-tà, **HROTSUITA,** hrŏts'vē-tà, or **HROSWITHA,** hrŏs'vē-tà (c.935–?). A Saxon nun and poet, of noble birth. She early entered the aristocratic Benedictine cloister at Gandersheim, near Göttingen, and died there after 1001. She was well schooled in literature and theology. In imitation of Terence she wrote six Latin plays, which show familiarity with the classics and some dramatic power, also historical works on the deeds of Otho I and on the early history of Gandersheim. Her works were found and edited by Conrad Celtes, and printed at Nuremberg in 1501. The best edition is by Barack (Nuremberg, 1858); there is a school edition by P. von Winterfeld (Berlin, 1902). Consult: Rudolf Köpke, *Hrotsuit von Gandersheim* (Berlin, 1869); August Potthast, *Bibliotheca Historica Medii Ævi*, vol. i (ib., 1896); Alice Kemp-Welch, *Of Six Mediæval Women* (London, 1913).

ROSY CROSS KNIGHTS, or Philosophers. See Rosicrucians.

ROSY FINCH. See Leucosticte.

ROT. A common name for various plant diseases. See Diseases of Plants; Fungi, Economic.

RO'TA (Lat., wheel). A tribunal through which the Pope in the days of his temporal sovereignty administered justice in disputed cases relating to the temporalities of the Church throughout Christendom and the more important civil cases of a similar nature from the Papal States. The name possibly came from the circular arrangement of the seats of the judges, or auditors as they were called. The existence of this tribunal cannot be traced back with certainty beyond the thirteenth century. Sixtus IV in 1472 fixed the number of the auditors at 12, and succeeding popes gave them many privileges. In 1908 Pius X reëstablished the tribunal to try cases coming before the Pope and to give opinions on contested points. Its constitution is in *Acta Apostolicæ Sedis* (Rome, 1909), and its decisions are published at various dates. Consult Capello, *De Curia Romana.*

RO'TANG. See Rattan.

RO'TARY CONVERTER. See Dynamo-Electric Machinery.

ROTARY PUMP. See Pumps and Pumping Machinery.

ROTA'TION. See Mechanics.

ROTATION (Lat. *rotatio*, from *rotare*, to rotate, from *rota*, wheel; connected with Ir., Gael. *roth*, Welsh *rhod*, Lith. *ràtas*, wheel, Skt. *ratha*, chariot, OHG. *rad*, Ger. *Rad*, wheel). In plants, the flowing of the protoplasm within the cell wall of certain plants and plant tissues. This may occur when there is a single large central sap-cavity (vacuole), around which the protoplasm lies, or when there are several vacuoles, in which case several currents may be

A CELL FROM A HAIR OF A POPPY (*Chelidonium majus*).
Showing currents in the protoplasm in the direction of the arrows.

observed in different directions at the same time. (See Illust.) These movements seem to be related to the amœboid movements. (See Movement.) If these are due to changes in surface tension, perhaps brought about by oxidation, rotation may be similarly explained. Nothing, however, is definitely known in this regard. Rotation may be studied readily in the young cells at the tip of *Nitella* or in the rhizoids of *Chara*, and in the hairs on the stamens of *Tradescantia* (wandering Jew).

ROTATION OF CROPS. The practice of growing various crops from one year to another upon a given field. This practice is followed

for convenience in farm work and for maintaining and increasing the fertility. The theory of rotation is based on such considerations as the following: Plants differ much in habit of growth and in the proportion of the elements which they draw from the soil. Deep-rooted plants have a beneficial effect on the physical condition of the soil and are capable of obtaining food and moisture from the subsoil at comparatively great depths, while shallow-rooted plants do not enter the subsoil to such an extent and are more dependent upon the surface soil. The quantity and proportion of the crop remaining upon the soil ready to be turned under by the plow differs with the various crops. The cultivation of hoed crops, such as Indian corn, tends to free the land from weeds; leguminous plants enrich the soil in nitrogenous plant food by assimilating the free nitrogen of the air (see CLOVER); and fall-growing crops take up the available nitrogen from the soil and thus prevent its leaching away by the rains of winter and spring. Furthermore, plants having a long season of growth are better adapted to soils with a small supply of available plant food than rapidly growing plants, which need an abundance of available material during their short period of vegetation. The rotation of crops also tends to free the soil from plant diseases and injurious insects. The crops consumed upon the farm tend more to maintain fertility than those which are sold; and crops differing in season, cultivation, and growth allow a convenient arrangement of the farm work throughout the year. Crop rotations vary in duration and are generally referred to as being of 2, 3, 4, or more year rotations. The succession of crops in the rotation is governed by the kind of farming practiced. Grain farming, e.g., requires different rotations than mixed or stock farming. The crop successions and combinations are so numerous that specific rotations are not mentioned here. Consult E. C. Parker, *Field Management and Crop Rotation* (St. Paul, 1915).

ROTATION OF PLANE OF POLARIZATION. See LIGHT.

ROTCH, rōch, ABBOTT LAWRENCE (1861–1912). An American meteorologist, born in Boston. He graduated at the Massachusetts Institute of Technology in 1884 and in the next year established near Boston the Blue Hill Meteorological Observatory. There he made researches on the clouds and employed kites for weather observations. In 1906 he was appointed professor of meteorology at Harvard, being the first incumbent of such a chair in any American university. Rotch edited, in part, *The American Meteorological Journal* (1886–92) and in 1891 was appointed to the international committee on the nomenclature of clouds. His publications include the annual reports of the Blue Hill Observatory (1887 et seq.); *Sounding the Ocean of Air* (1900), a popular work; *The Conquest of the Air* (1909); *Charts of the Atmosphere for Aëronauts and Aviators* (1911), with A. H. Palmer.

ROTH, rōt, FREDERICK GEORGE RICHARD (1872–). An American sculptor. He was born in Brooklyn, N. Y., and studied at the Vienna Academy under Hellmer and Meyerheim and for two years at the Berlin Academy. After his return to the United States, where he resided at Englewood, N. J., he became especially known for his small animal groups, which display unusual sympathetic insight and originality, together with decided technical ability. The Metropolitan Museum possesses five small bronzes, including "Performing Elephants." Roth became a member of the National Academy (1906), the National Sculpture Society, the Architectural League, and the National Institute of Arts and Letters, and received medals at St. Louis in 1904 and at Buenos Aires in 1910.

ROTH, rōt, JUSTUS LUDWIG ADOLF (1818–92). A German geologist and mineralogist, born in Hamburg. He studied pharmacy and was a druggist in Hamburg from 1844 to 1848. In the latter year he went to Berlin as privatdocent of geology, and he was made professor there in 1867. Roth published: *Die Gesteinanalysen* (1861); *Beiträge zur Petrographie der plutonischen Gesteine* (1869–84); *Allgemeine und chemische Geologie* (1879–93).

ROTH, RUDOLF VON (1821–95). A German Orientalist, born at Stuttgart and educated at Tübingen and Berlin. He continued his studies at Paris (under Burnouf) and London and in 1848 was appointed assistant professor in Tübingen University, becoming full professor and librarian in 1856. His chief work is the monumental *Sanskrit Wörterbuch* (7 vols., St. Petersburg, 1853–75), compiled in collaboration with Böhtlingk (q.v.). He edited Yaska's *Nirukta* (1852) and, with Whitney, the *Atharva Veda* (1855–56). His original works include: *Zur Litteratur und Geschichte des Veda* (3d ed., 1846); *Der Atharva-Veda in Kaschmir* (1875); *Ueber Yaçna 31* (1876). In 1893 a *Festgruss*, or volume of original articles, was presented to him by his pupils and friends.

ROTHE, rō'te, RICHARD (1799–1867). A German theologian, born at Posen. After serving for four years as chaplain to the Prussian Embassy at Rome, he became successively member, professor (1828), director, and ephorus (1832) of the theological seminary of Wittenberg. In 1837 he was nominated professor of theology at the University of Heidelberg, and here he remained, except for five years (1849–54) at Bonn. His *Theologische Ethik* (2d ed., 1869) is a complete system of speculative theology. Many fierce countertreatises were evoked by the attitude assumed by the author towards the relations of church and state, in his *Die Anfänge der christlichen Kirche*, of which but one volume was published (1837). His theological work, especially his discussion of the relations of ethics to religion, is of great historical importance. His posthumous works are: *Dogmatik* (1870), lectures; *Predigten* (1872); *Vorlesungen über Kirchengeschichte und Geschichte des christlich-kirchlichen Lebens* (1875–76); *Abendandachten über die Pastoralbriefe* (1876–77); *Der erste Brief Johannis* (1878); *Theologische Encyklopädie* (1880); *Geschichte der Predigt* (1881); *Gesammelte Vorträge* (1886). Consult his *Life* by F. Nippold (Wittenberg, 1873–75); W. Hönig (Berlin, 1898); A. Hausrath (2 vols., ib., 1902–06); R. Kern (Cassel, 1904).

RÖTHELN, rē'teln. See GERMAN MEASLES.

ROTHENBURG OB DER TAUBER, rō'tenbụrk ŏp dĕr tou'ber. A town of Bavaria, Germany, 30 miles south-southeast of Würzburg (Map: Germany, D 4). It is a very ancient and picturesque place and is still surrounded by well-preserved fortifications. It manufactures baby carriages, toys, gold and silver ware, agri-

cultural implements, and wine. The St. Jakobs Church, dating from 1373, is an interesting basilica. Rothenburg was a free Imperial city from 1274 to 1803. Pop., 1900, 7923; 1910, 8621.

ROTHENSTEIN, rō'then-stīn, WILLIAM (1872–). An English portrait, figure, and landscape painter, born at Bradford, Yorkshire. He studied under Legros at the Slade School, London, and under Lefebvre, Constant, and Doucet in Paris. He seems, however, to have been more influenced by the art of Degas and Whistler. Important works executed soon after his return to England include the portrait group of Furse, Steer, Sickert, and MacColl (1894); "Porphyria" (1895); "The Red Skirt" (1895). Through his able technique, good feeling for composition, and clever massing of detail, with which were combined sterling and sincere qualities of presentation, he soon won recognition. Good examples of his work are: "The Sculptor" (1896, Bremen Art Gallery); Augustus John (1898, Walker Art Gallery, Liverpool); portrait of himself (Metropolitan Museum, New York, 1898); "At the Spitalfields Synagogue" (Gallery of Modern Art, Dublin, 1904); "Aliens at Prayer" (Melbourne, 1905); and the unusual "Jews Mourning in the Synagogue" (Tate Gallery, London, 1906). Among various series of portrait drawings published by him are: *Oxford Characters* (1896); *English Portraits* (1898); *Manchester Portraits* (1899); *Liber Juniorum* (1899); *The French Set* and *Portraits of Verlaine* (1898). An interesting exhibition of his paintings and drawings was held in New York in 1911.

ROTHERHAM, rŏTH'ĕr-ăm. A manufacturing town in the West Riding of Yorkshire, England, 6 miles northeast of Sheffield on the Don (Map: England, E 3). The Free Grammar School, founded in 1584 and restored in 1858, and the courthouse are handsome buildings. There are also an Independent College, a mechanics' institute, an infirmary, and two fine parks. The town owns its gas and water works and maintains libraries, a museum, and technical schools. Neighboring coal and iron mines furnish materials for the manufactures, the chief of which are stoves, grates, glass, and pottery. The town dates from the Roman period. During the Civil War it sided with the Parliamentarians, was taken possession of by the Royalists in 1643, and retaken by Parliament after Marston Moor. Pop., 1901, 54,349; 1911, 62,483. In the vicinity are the well-preserved remains of Roche Abbey, erected in 1147, and Conisborough Castle, a massive ancient stronghold, mentioned in Scott's *Ivanhoe.* Consult J. Guest, *Historical Notices of Rotherham* (London, 1879).

ROTHERMEL, rŏTH'ĕr-mĕl, PETER FREDERICK (1817–95). An American historical painter. He was born at Nescopack, Pa., and was a pupil of Bass Otis in Philadelphia. At first a portrait painter, he soon changed to historical subjects. From 1847 to 1855 he was director of the Pennsylvania Academy. He then spent three years studying in Europe. His best-known works include: "Columbus before Queen Isabella"; "Battle of Gettysburg" (1871), Memorial Hall, Fairmount Park, Philadelphia; "De Soto Discovering the Mississippi"; "St. Paul on Mars Hill"; the "Embarkment of Columbus," Pennsylvania Academy. Although a very prolific painter, with some talent for composition, Rothermel was deficient in real technical ability. His work now seems antiquated.

ROTHERMERE, rŏTH'ĕr-mēr, first BARON. The title of nobility of HAROLD SIDNEY HARMSWORTH (q.v.).

ROTHERSAND, rŏTH'ĕr-sănd. See LIGHTHOUSE.

ROTHESAY, rŏth'sâ. A seaport and popular watering place, the capital of Buteshire, Scotland, situated on the island of Bute, at the head of a deep bay in the Firth of Clyde, 40 miles west of Glasgow (Map: Scotland, C 4). The bay offers safe anchorage and is spacious enough to contain the largest fleet and is regularly entered by nearly all the Clyde steamers to and from the West Highlands. In the middle of the town are the ruins of Rothesay Castle, built about 1103. Rothesay is a resort for invalids suffering from pulmonary affections. Fishing is followed, and shipbuilding is carried on. Pop., 1901, 9323; 1911, 9299. Consult Roger, *Rothesay Castle* (London, 1896).

ROTH'ROCK, JOSEPH TRIMBLE (1839–1922). An American botanist, born at McVeytown, Pa. He graduated at Harvard in 1864, served in the Civil War as captain of Pennsylvania cavalry, and in 1867 completed a course in medicine at the University of Pennsylvania, where, after service on the Wheeler geographical survey, he was professor of botany from 1877 to 1893. Thereafter until 1905 he was State Commissioner of Forestry. In 1903 he founded a State institution for consumptives, of which he was superintendent until 1908. Rothrock published: *Flora of Alaska* (1867); *Botany of the Wheeler Expedition* (1878); *Pennsylvania Forestry Reports* (3 vols., 1895–97); *Vacation Cruisings* (1884).

ROTHSCHILD, rôt'shĭlt, *Eng. pron.* rŏths'-chīld. A family of European bankers, financiers, and philanthropists. The founder of the family, MAYER ANSELM (1743–1812), was born at Frankfort-on-the-Main, the son of a Jewish merchant. After some experience as clerk in a counting house at Hanover, he returned to Frankfort and opened a money-exchange business. Being a man of good character and considerable information, he attracted the attention of the Landgrave (afterward Elector) of Hesse-Cassel. In 1806, when the Elector fled before the French, he intrusted Mayer Anselm with the care of his private fortune. The merchant justified the trust reposed in him; his fame as a financier spread, and he accumulated a large fortune. His three sons, Anselm, Salomon, and Nathan, became associated with him in business, and later on his two youngest, Jakob and Karl, were taken into partnership. All his sons were made barons by the Emperor of Austria in 1822. The oldest, MAYER ANSELM (1773–1855), carried on the business at Frankfort, where he died without issue. The Frankfort business was carried on by the sons of Karl, on the death of the younger of whom in 1901 that firm went into liquidation. SALOMON (1774–1855) became head of a banking establishment at Vienna. He was succeeded by his son Anselm Salomon (1803–74), who was followed by his son Albert (1844–1911). The third son, NATHAN (1777–1836), founded a branch of the house at Manchester in 1798 and removed in 1803 to London. Large sums of money placed at his disposal were invested with so much judgment that his capital multiplied with rapidity. KARL (1788–

1855) founded a banking house in Naples. JACOB (James) (1792–1868) became chief of the family interests in Paris in 1812 and was succeeded by his son Alphonse (1827–1905). In addition to their five principal establishments the Rothschilds established agencies in many other cities both of the Old and New World.

LIONEL (1808–79), eldest son of Nathan and head of the London house, was born in London and was educated at Göttingen. He was elected to Parliament for London in 1847, 1849, 1852, and 1857 and at each election claimed the right to take the oaths and his seat in the House of Commons. The last words of the oath—"on the true faith of a Christian"—he insisted upon omitting, "as not being binding on his conscience." He was then desired to withdraw from the House. In 1858 he was placed on a committee which was to hold a conference with the House of Lords, and this was virtually the means of establishing Jewish emancipation. The Commons sent up another bill, and the Lords gave way, merely taking measures to prevent the admission of Jews into the Upper House. Lionel Rothschild thereupon (July, 1858) took the oaths and his seat. (See RUSSELL, LORD JOHN.) He sat till 1868, when he was defeated, but was reëlected in 1869 and again lost his seat in 1874.

Lionel's son, NATHAN MAYER, first LORD ROTHSCHILD (1840–1915), who became head of the English house, was born in London and was educated at Trinity College, Cambridge. He succeeded his uncle in a baronetcy in 1876 and his father as an Austrian baron in 1879. As Liberal member for Aylesbury he sat in Parliament from 1865 to 1885, when he was raised to the peerage, the first representative of his faith to be so honored (Disraeli was a Jew by race but not by creed). Regarded as the leader of English Jews, Lord Rothschild served as president of the United Synagogue of London and was active in protecting Jewish interests in all countries, refusing to make profitable loans to Russia because of the treatment of his race in that country. He made donations to all sorts of public movements and at the time of his death was president of the British Red Cross, which by April 1, 1915, had raised $7,500,000 for the care of soldiers wounded in the European War. Lord Rothschild was often consulted by Gladstone and Disraeli, whom he aided in the Suez Canal (q.v.) coup. From Cambridge he received the degree of LL.D. At the time of his death the total wealth of the Rothschild family in its various branches was estimated to be $2,000,000,000.—LIONEL WALTER (1868–), eldest son of Nathan Mayer Rothschild, succeeded his father in the family title, but his interests were largely scientific. Born in London and early a student at Bonn and at Magdalene College, Cambridge, he sat in Parliament as a Liberal Unionist from 1899 to 1910. He wrote much on zoölogy and in 1911 was elected a fellow of the Royal Society. Consult: John Reeves, *The Rothschilds* (Chicago, 1887); De Schreb, *Geschichte des Hauses Rothschild* (Berlin, 1892); Ignatius Balla, *Romance of the Rothschilds* (New York, 1913).

ROTHSTEIN, rōt'shtīn, JOHANN WILHELM (1853–). A German Old Testament scholar, born at Pahl in the Rhine Province. He was educated at Bonn and Halle and became professor of Old Testament exegesis in the University of Halle in 1889 and at Breslau in 1910. His work includes: *Das Bundesbuch und die religionsgeschichtliche Entwicklung Israels* (1888); *Das Hohe Lied* (1893) and the article on the Song of Songs in Hastings, *Dictionary of the Bible*,—a strong plea for a dramatic theory; Chronicles, Jeremiah, Ezekiel, and Zephaniah (in Kautsch's Old Testament), Daniel, Baruch, and the Epistles of Jeremiah (in Kautsch's Apocrypha), Jeremiah and Ezekiel (in Kittel's *Biblia Hebraica*), etc.; *Der Gottesglaube im alten Israel* (1900); *Juden und Samaritaner* (1908), a study of the book of Haggai; *Grundzüge des hebräischen Rhythmus* (1909); *Psalmentexte und der Text des Hohen Liedes rhythmisch und kritisch bearbeitet* (1909). He translated the Megillah (1912) in Fiebig's *Mischnatractate*.

ROTH'WELL. A town in the West Riding of Yorkshire, England, 4 miles south of Leeds. It has collieries, stone quarries, and rope and match factories. Pop., 1901, 11,700; 1911, 14,277.

ROTHWELL, WALTER HENRY (1872–). An American pianist and orchestral conductor, born in London. He graduated from the Royal Academy at Vienna, winning the gold medal, and continued his studies with Epstein, Fuchs, Thuille, and Schillings. He followed the career of a piano virtuoso until 1895, when he became assistant conductor to Mahler at the Hamburg Opera. After serving as principal conductor at various German opera houses, he was general musical director of the opera at Amsterdam during the season of 1903–04. From 1904 to 1908 he was conductor for Savage's opera company in English, directing the performances of *Parsifal* and *Madame Butterfly*. From 1908 until its dissolution, in 1914, he conducted the St. Paul Symphony Orchestra. He wrote a concerto for piano, an orchestral suite, and some chamber music.

ROTIF'ERA (Neo-Lat. nom. pl., from Lat. *rota*, wheel + *ferre*, to bear) or ROTATORIA. A group of minute animals, the wheel animalcules, including many of the smallest of multicellular animals. They form a class of the phylum Trochelminthes (q.v.). They are almost without color, though with pigment eyes in most cases, and are generally microscopic. They occur in both fresh and salt water in all parts of the earth and many species are nearly cosmopolitan in their distribution. They are now regarded as highly specialized or degenerate worms, but their nearest relatives are still undetermined. Rotifers are only slightly elongated animals, covered with a smooth, hard, chitinous cuticle, generally marked off into six folds or sections, but there is no internal evidence of any true segmentation. The body usually ends in a prolongation popularly called a tail, but known to zoölogists as the foot. It is composed of muscular and glandular tissues and often terminates in a pair of forceps by which the animal can attach itself to leaves and other objects. At the anterior end of the body are a pair of ciliated disks, with the mouth between them. These disks are rarely circular in outline, but are usually lobed on the margin, or may even be separated into two disks. The margin of each disk is surrounded by one or two bands of cilia, by means of the constant movement of which food is collected and swept into the mouth, and this movement is so rapid and uniform that the entire disk

appears to revolve, and thus have arisen the various names of the groups. Not only do these ciliated organs serve for collecting the food, but they are also the means of locomotion, rotifers swimming about gracefully, though not with remarkable rapidity, by means of them. They are entirely under the control of the animal. The digestive apparatus is well developed in the female, but in the males it consists of only the pharynx and cloaca. The nervous system consists of a cerebral ganglion with radiating fibres. Eyes are also present in many rotifers, but they are merely pigment spots, rarely provided with a lens. There is no circulatory system, but excretory organs are well developed. The female reproductive organs consist of a round or oval ovary, lying beside the stomach, and an oviduct opening into the cloaca. Two different kinds of eggs are produced, thin-shelled summer eggs and thick-shelled winter eggs. (See EGG.) Males are very rare and in many species are as yet unknown to science. They are much smaller than the females and of much simpler organization, and are produced mostly by the last laying of small summer eggs each season. The males are very short-lived and hence have little need of a digestive canal. Consult: Hudson and Gosse, *The Rotifera or Wheel Animalcules* (London, 1889); Marcus Hartog, "Rotifers," in *Cambridge Natural History*, vol. ii (New York, 1896); Parker and Haswell, *Text-Book of Zoölogy* (ib., 1910). For an account of the rotifers of the United States, consult H. S. Jenning, "Rotatoria of the United States," in United States Fish Commission, *Bulletins* for 1899 (Washington, 1900).

ROTOGRAVURE, rō'tō-grȧ-vūr' *or* -grā'vûr. A photomechanical intaglio process for the rapid printing of fine photographic illustrations. These illustrations, together with the accompanying text, are etched on copper cylinders and are printed on a rotary machine which can print both sides of the paper simultaneously with a running speed of 3000 impressions per hour, the paper being fed from a reel and delivered in cut sheets. This process, which resembles photogravure in its results, was devised originally in Germany and brought out in the United States in 1912. It is now extensively used and enables the art supplements of Sunday newspapers, as well as illustrated weekly papers, to be prepared with a high degree of artistic excellence and affords a faithful reproduction of the original object. See PHOTO-ENGRAVING; PRINTING.

ROTOM'AGUS. See ROUEN.

ROTROU, rō'trōō', JEAN DE (1609–50). A French dramatist, born in Dreux. At 19 he was successful on the stage with *L'Hypocondriaque*. About 1635 Richelieu made him one of the famous five employed to write tragedies from his plots. Rotrou's earlier plays were mostly based on Spanish dramas, especially on those of Lope de Vega; and at a later period he was more clearly under classical influence. Corneille also influenced him considerably. After Corneille and Racine Rotrou was the most important writer of tragedies in the seventeenth century. The more notable of his plays are: *La bague d'oubli* (1635); *Cléagénor et Doristée* (1635); *Le véritable Saint-Genest* (1646), probably his best tragedy; *Venceslas* (1648), a tragedy which long held the stage; *Cosroès* (1648). A complete edition was brought out by Viollet-le-Duc (Paris, 1820 et seq.). Consult: Jarry, *Essai* (Paris, 1868); Chardon, *La vie de Rotrou* (ib., 1884); and particularly T. F. Crane, *Rotrou* (Boston, 1907).

RÖTSCHER, rēt'shēr, HEINRICH THEODOR (1803–71). A German dramatic critic. He was born in Mittenwalde, studied at Berlin and Leipzig, and from 1828 to 1845 was professor in the Gymnasium of Bromberg. Then he became dramatic critic to the *Spenersche Zeitung* of Berlin. His principal work is the *Kunst der dramatischen Darstellung* (1841–46; 2d ed., 1864). Among his works may be mentioned: *Aristophanes und sein Zeitalter* (1827) and *Abhandlungen zur Philosophie der Kunst* (1837–47), both strongly tinged with Hegelianism; *Shakespeare in seinen höchsten Charaktergebilden* (1864); *Dramaturgische und ästhetische Abhandlungen* (1864–67); *Seydelmanns Leben und Wirken* (1845).

ROTTEN BOROUGH. See BOROUGH.

ROTTENHAMMER, rôt'ten-häm'ẽr, JOHANN (1564–1623). A German historical painter, born at Munich. He was a pupil there of his father and of Hans Donauer, was influenced by Tintoretto in Venice, and settled at Augsburg in 1607. His best pictures, mythological and biblical subjects, painted on copper and small in scale, are to be found in all the principal galleries of Europe. They are carefully drawn and possess a certain charm of color and form. Such are "Dancing Children" (Munich Pinakothek), "The Last Judgment" and others in the Vienna Gallery. His only painting with life-size figures is the "Death of Adonis," in the Louvre.

ROTTEN ROW. A fashionable bridle path in Hyde Park, London, 90 feet wide, extending for a mile and a half from Hyde Park Corner to Kensington Gate, along the south side of the Serpentine. It runs parallel with the driveway, from which it is separated by a promenade fringed with turf. Some of the most brilliant displays of fashion and wealth in London are to be seen on the walks along its side on fine afternoons during the season and at the church parade on Sundays. The name is supposed to be derived from Route de Roi, or King's Drive, and the King is the only person who may drive down it in a carriage, although the public are free to ride along it on horseback.

ROTTENSTONE. A soft abrasive material that is used for cleaning and polishing brass and other metals and wood. It is supposed to be a decomposed siliceous limestone and consists essentially of aluminium silicate with carbonaceous matter. Several localities in Derbyshire, England, and in Wales are the principal sources.

ROT'TERDAM, *Dutch pron.* rŏt'tẽr-däm'. The second largest city and chief commercial port of the Netherlands, in the Province of South Holland, on the Meuse at the mouth of the canalized Rotte, about 15 miles southeast of The Hague and 44 miles south-southwest of Amsterdam (Map: Netherlands, C 3). It is divided into two parts by the Hoog Straat (High Street) and is intersected by an iron railway viaduct. Adjoining the old city on all sides are the new quarters which have sprung up on the southern as well as on the northern bank of the river and are generally well laid out. Along the Meuse extends the beautiful quay known as the Boompjes (little trees).

The principal square is the Groote Markt. Rotterdam has few ecclesiastical buildings of interest. The Groote Kerk is a late fifteenth-century brick edifice, built in the Gothic style and containing an organ notable for its size and many monuments to Dutch naval heroes.

Among the secular buildings the following deserve mention: the exchange (1723), the town hall, the courthouse, and the postoffice. On the northern side of the town is the Delft Gate, the only one remaining of the old city. Beyond it are situated the fine zoölogical and botanical gardens, founded in 1857. West of the city is a fine, though small, park. The principal collection of Rotterdam is the large picture gallery in the Boyman's Museum (1867). In the ground floor of the museum are the municipal archives and library. There are also interesting collections in the maritime museum. The municipality operates gas and electric plants and maintains a pawnshop. The water supply is obtained from the Meuse and is purified by filtration.

The principal industry is shipbuilding; of some importance are the manufactures of cigars, spirits, paints, chemicals, rope, leather, and sugar. The Rotterdam system of docks and harbors is among the most extensive in the world. A canalized arm of the Meuse known as the Nieuwe Waterweg extends from Rotterdam to the North Sea. The position of Rotterdam makes it the centre of the maritime as well as of the Rhine and Meuse trade of the Netherlands. Its commerce shows an extraordinary increase since 1850. In 1908 vessels entered with cargo at Rotterdam totaled 23,779 cubic meters net, and cleared 10,033; in 1912, 30,868 (67.3 per cent of the total for the Netherlands) and 16,820 (57.1 per cent).

The chief imports are grain, ores and metals, petroleum, coffee, tobacco and cigars, tea, and hides and skins. The exports consist chiefly of the above-mentioned articles and include also timber and animal products. Rotterdam has regular steam communication with the principal seaports of Europe as well as with the United States, the Dutch East Indies, and Africa. During the last century there has been a very great increase of population, due in part to the annexation of adjacent communes. The population of Rotterdam including Delftshaven (annexed in 1886), was 72,294 in 1830; 1860, 106,122; 1880, 148,102; 1900, 318,507 (including Kralingen and Charlois, annexed in 1895); 1910, 417,989; 1914 (est.), 459,357; Dec. 31, 1920, 510,538. The people are mostly Protestant. Area of Rotterdam in 1909, 6187 hectares (including about 700 hectares of water).

Rotterdam received municipal rights in 1299 and grew so rapidly that its boundary lines were repeatedly extended. It gained its commercial ascendancy during the nineteenth century.

ROTTI, rŏt'tē. An island of the Dutch East Indies, situated near the southwest end of Timor (Map: East India Islands, F 8). It has an area of 653 square miles. It is fertile and well watered, producing rice, tobacco, sugar, cotton, and indigo. The island is still ruled by native chiefs under the supervision of a Dutch Resident at Baä, and forms a part of the Dutch Residency of Timor. Pop. (est.), 66,000, principally Malays.

ROTTMANN, rŏt'mân, KARL (1798–1850). A German landscape painter, born at Handschuchsheim, near Heidelberg. He formed his art chiefly through the study of nature and of classical landscape painters, and after gaining prominence by "Heidelberg at Sunset" (water color) and "Castle Eltz," he settled in Munich (1822), devoting himself to Bavarian scenery. His success in characterizing the main features of a landscape and producing theatrical effects in line and color gave rise to a new classical or heroic tendency in German landscape painting. During his travels in Italy (1826–28) he made sketches for the 28 Italian landscapes in fresco which he was commissioned to paint in the arcades of the Hofgarten at Munich (1829–33) and which constituted Rottmann's most important work, but unfortunately these deteriorated under climate influences and injudicious restoration. The cartoons are in the Darmstadt Gallery. In 1834–35 Rottmann traveled in Greece, and the results of this journey were 23 Greek landscapes, which were placed in a special room in the New Pinakothek, Munich. Of his easel pictures "Ammer Lake" and "Marathon" are in the National Gallery, Berlin; "The Acropolis of Sikyon" and "Corfu" in the Pinakothek, Munich; others in the Schack Gallery, Munich, and in Karlsruhe; and seven in the Leipzig Museum. Though sometimes impressive in line and composition, his paintings lack a real color sense. Consult Regnet, in Robert Dohme, *Kunst und Künstler*, vol. iv (Leipzig, 1885).

ROTUN'DA (from Lat. *rotunda*, fem. of *rotundus*, round). Primarily, a circular hall; as such applied specifically (*a*) to the Pantheon (q.v.) at Rome (la Rotonda); (*b*) to the Villa Capra by Palladio (q.v.), near Vicenza; and (*c*) to the circular hall under the dome of the capitol at Washington. Secondarily, as a common noun, any interior central space of circular or approximately circular form in a public building and, by extension, the central space for general concourse in a hotel—a local American usage. The rotunda of the old Hotel St. Louis at New Orleans (1845), now ruinous, was famous as a slave mart and rendezvous of politicians before the Civil War.

ROTY, rô'tē', LOUIS OSCAR (1846–1911). A French medalist and engraver, born in Paris. He was a pupil of Ponscarme and Dumont and won the Prix de Rome in 1875. With Chapu, Degeorge, and Chaplin, he ranks as the greatest reviver of medallic art in France during the last century, and in his hands it acquired a more intimate and practical character, yet without losing in symbolism and power. He was an excellent draftsman, particularly admirable in his treatment of drapery, and possessed a strong sense of the decorative, great originality, and individual ideas, which he embodied in picturesque devices on the reverse of his medals. He also excelled in portraiture, among his best work in this line being the portraits of Henri Bouley, Duplessis, Gambetta, and Sir John Pope Hennessy. His best-known commemorative medals include those for the death of President Carnot, the twenty-fifth anniversary of the Franco-Prussian War, and the fiftieth anniversary of the Maison Christofle. Roty also designed the new silver coins for the French Republic. He was a Commander of the Legion of Honor, a member of the Institute, and received the Grand Prix at the Paris Exposition (1900) and the medal of honor in 1905. Consult Mazerolle, *L. O. Roty* (Paris, 1897).

ROU. See ROLLO.

ROUARIE, rōō'ȧ'rē', MARQUIS DE LA. See ARMAND, CHARLES TEFFIN.

ROUBAIX, rōō'bȧ'. A manufacturing town in the Department of Nord, France, 7½ miles northeast of Lille (Map: France, N., J 2). Its rise dates from the first quarter of the nineteenth century, when its population was 9000. The annual value of its textiles is over $80,000,000. There are also other manufactures. The town possesses the important Ecole Nationale des Arts Industriels. Roubaix was captured by the Germans in the European War which began in 1914. See WAR IN EUROPE. Pop., 1911, 122,723.

ROUBILLAC, rōō'bē'yȧk', or **ROUBILIAC,** LOUIS FRANÇOIS (1695–1762). A French sculptor, active chiefly in England. He was born at Lyons and studied under Nicolas Coustou and then under Balthazar at Dresden. About 1730 he settled in England, where he introduced freer and more poetic conceptions in sculpture and executed many well-known works. His most important monuments are those of the Duke of Argyll, Lady Elizabeth Nightingale, Sir Peter Warren, and Handel (1761), all in Westminster Abbey, and the statue of Shakespeare (1758), in the British Museum. Among his highly characteristic busts from life are those of Hogarth (National Portrait Gallery), Garrick (Garrick Club), Handel (Royal collection), and Newton, Willoughby, and other great scholars, at Trinity College, Cambridge. In beauty, truthfulness, and animation Roubillac is far ahead of the English sculptors of his day. Consult E. B. Chancellor, *British Sculptors* (London, 1911).

ROUCHER, rōō'shā', JEAN ANTOINE (1745–94). A French poet, born at Montpellier. He studied for the priesthood, but turned to poetry. His "La France et l'Autriche au temple de l'hymen," written for the marriage of Louis XVI to Marie Antoinette, brought him a sinecure governmental position. At the time of the Revolution he first sided with the Constitutional monarchy, but was arrested as a suspect in 1793, kept in prison eight months, and, two days before the fall of Robespierre, was put to death with André Chénier (q.v.). His main work was a didactic poem, *Les mois* (1779), mediocre, but once highly praised. He wrote also *De la richesse des nations* (1790). The *Correspondance de Roucher* was published posthumously, edited by his son-in-law (1797).

ROUCOUYENNE, rōō'kōō'yĕn'. A tribe of Cariban stock (q.v.) in the mountain country about the headwaters of Maroni River, French Guiana. They take their name from the roucou, a vegetable coloring matter with which they paint their skins. They are naturally of light complexion. Marriages of father and daughter and of brother and sister are said to be common among them. Consult J. N. Crevaux, *Voyages dans l'Amérique du Sud* (Paris, 1883), and D. G. Brinton, *The American Race* (New York, 1891).

ROUEN, rōō'ĕN'. The capital of the Department of Seine-Inférieure, France, on the Seine, 87 miles northwest of Paris by rail (Map: France, N., G 3). It is one of the principal manufacturing and trading cities of France. It stands on the north bank of the river, on level ground slightly rising towards the east. Some of the streets are regularly built, traversed by street railways, and lined by fine modern stone houses, but the majority are of the mediæval, ill-built, and narrow though picturesque order, crowded with lofty, quaintly carved timbered houses with overhanging gables. A stone bridge and a suspension bridge connect the city with the manufacturing faubourg Saint-Sever, on the left bank of the river. A viaduct across the river connects the Western with the Orléans railway. The site of the former encircling ramparts is now occupied by spacious, tree-bordered boulevards, which, as well as the quays that line the river banks for a distance of a mile and a half, rival the boulevards and quays of Paris.

Rouen is noted for its ecclesiastical architecture, of which the finest specimens are the cathedral and the church of Saint-Ouen. The former is a remarkably fine specimen of Gothic architecture. It is of cruciform shape and has two towers at the sides of the west entrance and a lofty but incongruous tower, 485 feet high (said to be the highest in France), which was constructed after the destruction by fire in 1822 of the belfry, which bore the date of 1544. The cathedral was erected between 1200 and 1220 (though parts of it were completed much later), and contains in its 25 highly ornamented chapels numerous monuments of great interest. The church of Saint-Ouen (fourteenth and fifteenth centuries) is as large as the cathedral and in its restored state presents a pure and elegant specimen of Gothic architecture. Other notable churches are the fifteenth-century flamboyant Gothic church of Saint-Maclou, the sixteenth-century churches of Saint-Vincent, Saint-Godard, and Saint-Patrice, and the restored Romanesque church of Saint-Gervais, with a fourth-century crypt. Of the secular buildings the finest are the Palais de Justice, belonging to the fifteenth century; the Hôtel de Ville, with its well-equipped public library and its gallery of pictures; the Hôtel Dieu; the fifteenth-century Hôtel Bourgthéroulde; and the striking fourteenth-century belfry or Tour de la Grosse Horloge, with its double-dialed and richly sculptured clock on a sixteenth-century arch spanning the street. The finest square is the Place de l'Hôtel de Ville. Joan of Arc was burned (1431) in the Place du Vieux Marché (since 1902 decorated with a fine memorial of the Maid of Orléans), and not in the Place de la Pucelle, where a mean-looking statue marks the spot that was long pointed out as the site of her martyrdom. The city possesses a museum, including a library of 150,000 volumes. Rouen is the seat of an archbishop.

The artificially deepened waters of the Seine form a commodious port admitting vessels of 22½ feet draft. There is a large export and import trade, chiefly with Great Britain, Spain, Russia, Italy, and the United States. The principal industry is the manufacture of cotton goods, including the checked and striped cottons especially designated as rouenneries, lace, cotton velvets, shawls, etc. There are also extensive manufactures of hosiery, mixed silk and wool fabrics, blankets, flannels, shot, chemicals, and refined petroleum. Among other branches of industry are shipbuilding and the manufacture of machinery. Pop., 1872, 102,470; 1891, 107,163; 1901, 116,316; 1911, 124,987.

Rouen is the ancient Rotomagus, which under the later Roman emperors was the capital of Lugdunensis Secunda. It figures early as the seat of a bishop. Rollo, with his Northmen, settled here at the close of the ninth century,

and the town became the capital of the Duchy of Normandy. It was wrested from King John of England by Philip Augustus in 1204. It was in the hands of the English from 1419 to 1449. Rouen was a Huguenot stronghold. It was occupied by German troops in the war of 1870–71. Consult: T. A. Cook, *Story of Rouen*, in "Mediæval Towns Series" (London, 1899); Girieud, *Rouen et ses monuments* (Rouen, 1899); Thomas Perkins, "Churches of Rouen," in Bell, *Handbooks to Continental Churches* (London, 1900); C. Enlart, *Rouen* (Paris, 1904); J. Levainville, *Rouen: étude d'une agglomération urbaine* (ib., 1913).

ROUEN DUCK. See DUCK; and Plate of DUCKS.

ROUERGUE, rōō'ârg'. A mediæval county of France, the capital of which was Rodez (q.v.).

ROUGE, rōōzh (Fr. *rouge*, OF. *rouge, roge*, red, from Lat. *rubius, rubeus*, red; connected with *ruber, rufus*, red, and ultimately with Eng. *red*). Any red coloring for the skin. For the purpose various coloring matters are used. That obtained from the safflower is greatly in vogue and is supposed to do the skin no harm. It is obtained through a long and elaborate process by precipitating it from the safflower, by means of citric acid or lemon juice, on to prepared cotton. It is then washed out of the cotton with a solution of soda and again precipitated with citric acid; but previous to adding the acid finely powdered French chalk is added to the solution, which becomes colored and falls down when the precipitation takes place, giving the necessary body and a peculiarly silky lustre to the coloring matter. (For rouge as a polish material, see ABRASIVES.) *Jeweler's rouge* is a preparation of iron formed by calcining sulphate of iron, or green vitriol, until the water of crystallization is expelled; it is then roasted in a strong heat and afterward washed with water until it no longer affects litmus paper. *Liquid rouge* is the red liquor left in making carmine. See IRON.

ROUGÉ, rōō'zhā', OLIVIER CHARLES EMMANUEL, VISCOUNT DE (1811–72). A French Egyptologist, born in Paris. His first memoir placed him among the foremost of contemporary Egyptologists. It was a refutation of the theories of Bunsen and was published (1846–47) in *Annales de philosophie chrétienne* under the title *Examen de l'ouvrage du chevalier de Bunsen: La place de l'Egypte dans l'histoire du monde.* In 1849 he was appointed keeper of the Egyptian collection of the Louvre. He made a valuable catalogue of the Paris collections (*Notice sommaire des monuments égyptiens du Louvre*, 1st ed., Paris, 1849; 3d ed., 1855). In his *Mémoire sur l'inscription du tombeau d'Ahmès* (1849) and his *Etudes sur une stèle égyptienne* (1856) he for the first time gave connected translations of entire hieroglyphic inscriptions and established the principles upon which the systematic study of these texts should proceed. His *Chrestomathie égyptienne* (4 vols., Paris, 1867–76) placed the study of Egyptian grammar upon a new footing, and in his *Recherches sur les monuments qu'on peut attribuer aux six premières dynasties de Manéthon* (Paris, 1864–65) he made a most valuable contribution to early Egyptian history. In 1860 he became professor of Egyptology in the Collège de France. After his death was published the valuable collection *Inscriptions hiéroglyphiques copiées en Egypte* (Paris, 1877–79).

ROUGE ET NOIR, rōōzh â nwär (Fr., red and black), or TRENTE ET QUARANTE. A game famous throughout Europe and a favorite mode of gambling. It is played on a long table covered with a green cloth, at each end of which there are two lozenge-shaped figures marked rouge (red) and noir (black) and colored accordingly. There are two centre divisions known as couleur, and at each end a trianglar division known as inverse, the opposite of couleur. The stake or bet may be placed on four different risks, according to the division of the table the player prefers. Six packs of cards are used shuffled together, each player shuffling a part of them, after which the whole are shuffled by the banker or dealer, who is always seated in the middle at one side of the table. The croupiers sit facing the banker and attend to all receipts and payments. The game begins by the dealer taking a single card, which is usually the blank one, and presenting it to one of the players, who inserts it in the complete pack at any point he desires. This constitutes the cut, after which the banker, taking a convenient handful from the top of the cut, deals one card face upward; the suit of this card is an important factor of the game. The dealer continues to deal the cards (face upward) alternately on either side of the card first dealt, until the aggregate in face value of the cards dealt amounts to or exceeds 31. In arriving at a total all court cards and tens count as 10, and the remainder according to the number of their pips. This first row of cards belongs to noir. The second row is then dealt in like manner until 31 or the nearest over that amount is reached. The row nearest that number wins, and the winners receive an amount equal to their stake. If couleur is played it is understood that the player is wagering that the winning color will be the same as that of the first card dealt; similarly the players who have placed their stakes inverse wager that it will be of the opposite color. A *refait* or tie is where both rows of cards aggregate the same total (from 32 to 40, inclusive); in which case the players neither pay nor receive. If the total, however, come to 31, the bank is entitled to half the stakes, and the player has the option of paying the half accordingly or wagering the whole by placing it within certain lines marked on the table and known as *la première prison* (the first prison) until the result of the next hand is declared. If the player wins, the entire stake is his; if the contrary is the case, the stake belongs to the bank. Consult R. F. Foster, *Complete Hoyle* (new ed., New York, 1909).

ROUGET DE LISLE, rōō'zhā' de lēl, CLAUDE JOSEPH (1760–1836). A French poet and composer. He was born at Lons-le-Saunier. It was at Strassburg on the night of April 24, 1792, that Rouget de Lisle, then a captain of engineers, wrote the immortal *Marseillaise.* (See MARSEILLAISE.) A few days later he was suspended from his rank because he refused to sanction the extreme measures of the Revolutionary party. After a two months' exile in Alsace he entered the army again as a volunteer under General Valance, who restored him to his former rank. During the Reign of Terror he was again proscribed and was confined in Saint-Germain-en-Laye, on being released from which he composed the *Hymn of the Ninth Thermidor.* Later the Convention endeavored

to atone for former injustice by giving him promotion. In 1796 he abandoned military life and went to Paris to devote himself to poetry and music. In 1830 he was pensioned by Louis Philippe. On July 14, 1915, the body of Rouget de Lisle was removed to Paris and with most impressive ceremony placed in the Hôtel des Invalides. His published works include: *Chant des vengeances* (1798); *Chant du combat* (1800); 50 *Chants français* (1825); and the libretti to a few operas. Consult A. Lanier, *Rouget de Lisle* (Besançon, 1907).

ROUGHLEG. An American buzzard hawk of the genus *Archibuteo*. See BUZZARD; and Plate of EAGLES AND HAWKS.

ROUGH RIDERS ASSOCIATION. A patriotic hereditary society, organized in 1899. It has for its objects the preservation of the memories of the war with Spain and the promoting of a lasting friendship among the members of the First Regiment of the United States Volunteer Cavalry, generally known as the Rough Riders. There are about 100 names on the roll.

ROUGH-WINGED SWALLOW. A swallow of the genus *Stelgidopteryx*, much like the bank swallow (q.v.), but peculiar in that the edge of the wing is roughened by having the ends of the web fibres bent into hooks. The common species of the United States is *Stelgidopteryx serripennis*. It is widely distributed in summer, breeding in bank burrows and in holes and crannies about cliffs, quarries, bridge piers, and the like, where the rough edges of its wings may help it to climb and cling. It is sooty brown above, mouse gray on the breast and sides, and white below.

ROUGON-MACQUART, rōō'gôN'-mȧ'kär,' LES. A famous series of romances by Emile Zola, in which it was the author's purpose to follow out the problems of heredity as exhibited in the persistence of family characteristics under different environments. Zola planned 12 volumes, but extended the design to 20, to which *Lourdes* (q.v.) and *Rome* (q.v.) were later added. The lines of development gave Zola opportunity to paint the life of many divisions of society, and in all the volumes he made intensive studies of the special class under review, fortifying his personal observation by facts drawn from all sources. The volumes of the series are: *La fortune des Rougon* (1871); *La curée* (1871); *Le ventre de Paris* (1873); *La conquête de Plassans* (1874); *La faute de l'abbé Mouret* (1875); *Son excellence Eugène Rougon* (1876); *Une page d'amour* (1878); *Nana* (1880); *Pot-Bouille* (1883); *Au bonheur des dames* (1883); *La joie de vivre* (1884); *Germinal* (q.v.) (1885); *L'Œuvre* (1886); *L'Assommoir* (1887); *La terre* (q.v.) (1887); *Le rêve* (q.v.) (1888); *La bête humaine* (1890); *L'Argent* (1891); *La débâcle* (1892); *Le docteur Pascal* (1893).

ROUHER, rōō'ȧ', EUGÈNE (1814–84). A French statesman, born at Riom, Puy-de-Dôme. He first distinguished himself as an advocate in his native town until 1848. Then he was elected to the Constituent Assembly, and in 1849 he was returned to the Legislative Assembly. On the break-up of the first ministry of Louis Napoleon, towards the end of 1849, Rouher was appointed Minister of Justice in the new ministry, and with slight interruptions he was a member of the government, chiefly as Minister of State, up to 1870. In the negotiation of the treaty of commerce with England in 1860 Rouher represented France and Cobden England. In 1863 he negotiated a treaty of commerce between France and Italy. Through these treaties and others with Belgium and Germany Rouher was active in furthering free trade. In July, 1869, his ministry resigned. On the downfall of the Empire in 1870 he fled to England, but returned to France and in 1872 was elected a member of the National Assembly from Corsica.

ROUJON, rōō'zhôN', HENRY (1853–1914). A French littérateur and administrator. He was educated at the lycées Henri IV and Saint-Louis. In 1874 he became a lawyer. He began his literary career when he founded, with Mendès and Mallarmé (qq.v.), *La République des Lettres*. During the 12 years (1891–1903) that he was Director of Fine Arts he systematized and coördinated the work of this department. He wrote a novel, *Miremonde* (1896), with preface by Dumas fils, and this was crowned by the Academy. But his best work is found in his *Essais* (art criticism and biography), which he called *Dames d'autrefois, Au milieu des hommes, La galerie des bustes*. Roujon was Commander of the Legion of Honor and perpetual secretary of the Academy of Fine Arts, and in 1912 he was elected to the French Academy.

ROULERS, rōō'lȧ', or **ROUSSELAERE,** rou'se-lär. A town of the Province of West Flanders, Belgium, on the Mandelbeke, a tributary of the Lys, 14 miles northwest of Courtrai (Map: Belgium, B 4). The church of St. Michael has a beautiful Gothic tower. Roulers has long been famous for its linen industry. There is an immense output of linen, lace, silk, ribbons, and cotton. In 1794 the Austrians under Clerfait were defeated here in a fierce battle by the French under Pichegru and Macdonald. It was occupied by the Germans in the Great War which began in 1914. (See WAR IN EUROPE.) Pop., 1900, 23,231; 1910, 26,071.

ROULETTE. See CYCLOID.

ROULETTE, rōō-lĕt'. A game of chance, usually associated with public gambling. The wager is as to which pocket out of a number in the circumference of a sunken circle on a table a small ivory ball will fall into. The pockets are numbered, and the numbers may be in any order and may run from 1 to 27, to 30, to 33, or to 36, besides which there are zero marks. The centre of the bed of the machine is set in motion by turning, with the forefinger, the cross which surmounts it, from right to left, causing a rotary motion. At the same instant a little ivory ball is thrown into the concavity of the wheel in a direction opposite to its motion. The ball gradually slows down and falls into one of the cavities. A few seconds before it stops the banker has the privilege of warning the spectators that it is too near its final selection for any more bets to be made. Though the principle of the game is eminently fair, experts can make a wheel which may be stopped at any point without detection from the player.

ROULROUL, rōōl'rōōl' (Malay name). A beautiful small crested partridge of the Malayan Islands and Borneo, two species of which are contained in the genus *Rollulus*. They dwell in the forests in small flocks and are extremely active. See Plate of PARTRIDGES, ETC.

ROUMA'NIA. See RUMANIA.

ROUMANILLE, rōō'mȧ'nē'y', JOSEPH (1818–

91). A Provençal poet. He was born at Saint-Remy (Bouches-du-Rhône). He is commonly known in southern France as the father of the Félibrige, for he first conceived the idea of raising the patois of his region to the dignity of a literary language. When Roumanille was a teacher in Avignon, he discovered the genius of Frédéric Mistral, one of his pupils, and together they began what later became the Félibrean movement. In 1847 Roumanille published a volume of verse called *Li Marbarideto* and in 1851 another entitled *Li Sounjarello*. In 1852 along with Mistral and Anselme Mathieu he edited a collection of Provençal verse called *Li Prouvençalo*. In 1853 he wrote a dissertation on Provençal spelling. His writing is of the wholesome, simple sort, adapted to the country folk of the region. The complete edition of his works includes *Lis oubreto en vers, Lis oubreto en proso, Li capelan, Li conte prouvençau e li cascareleto, Li nouvé, Lis entarrochin*, and *Letters*.

ROUND (OF., Fr. *rond*, It. *rotondo, ritondo*, from Lat. *rotundus*, round, wheel-shaped, from *rota*, wheel). In music, a short vocal composition, in three or more parts, all written on the same clef. Each voice takes up the subject at a certain distance after the first has begun. The second voice begins the first part when the first begins the second part, and the third takes up the first part when the second begins the second part, the whole ending together at the mark of a pause or at a signal agreed on. The round is really an *infinite canon*. It was very popular in England from early times. The famous round *Sumer is icumen in* is assigned to the thirteenth century. Originally the round was identical with the catch, but the latter became of a humorous character, while the former remained serious. See CATCH. For rounds in bell ringing, see BELL RINGING.

ROUND, JOHN HORACE (1854–). An English historian. He was educated at Balliol College, Oxford, and specialized in feudal and mediæval history, particularly of noble families. In 1914 he was appointed honorary historical adviser to the crown in peerage cases. He contributed to historical reviews, to the *Dictionary of National Biography*, etc., and published: *Geoffrey de Mandeville: A Study of the Anarchy* (1892); *Feudal England* (1895); *The Commune of London* (1899), with a great deal of material on London at the end of the twelfth century discovered by Round himself, and quite as valuable for London as the two preceding titles are for England in general at the same period; *Calendar of Documents Preserved in France* (1899); *Studies in Peerage and Family History* (1901); *Peerage and Pedigree* (1910); *The King's Serjeants* (1911).

ROUND, WILLIAM MARSHALL FITTS (1845–1906). An American prison reformer, journalist, and novelist, born in Pawtucket, R. I. He entered Harvard Medical School, but did not graduate; was given charge of the New England Department of the World's Fair, Vienna (1873); and, devoting himself to journalism in Boston and New York, was associate editor of the Boston *Globe* and afterward served on the staff of the *Independent*. He planned (1887–88) the Burnham Industrial Farm for Unruly Boys, at Canaan, N. Y., and was prominent nationally as a penologist. His books include: *Achsah: A New England Life Study* (1876); *Child Marian Abroad* (1876); *Torn and Mended* (1876); *Hal, the Story of a Clodhopper* (1878); *Rosecroft* (1880).

ROUNDABOUT PAPERS. A collection of delightful essays by Thackeray, contributed to the *Cornhill Magazine* in 1859–63 and published in 1863.

ROUN'DEL. A circular shield with which soldiers of the fourteenth and fifteenth centuries protected themselves. It was about a foot in diameter. In fortification, the name of a circular bastion. See FORTIFICATION.

ROUND'ERS. An outdoor ball game. The game has long been popular with boys in England, was played at one time in America, but gave way to baseball. Nine on each side play. The "in" side bat in rotation on a home base, and the striker drops the bat before he runs, for the use of the next batsman. The pitcher, or, as he is called, the feeder, occupies the same relative position as in baseball. The "out" side fields for the side that is "in" and must put the runners out by a catch or by striking them when between bases or by touching an empty base to which the runner is approaching. There are six bases. Every player has the option of refusing to strike at as many balls as he pleases or three only if so arranged, but whether he hits the ball or not (with one exception) if he strikes at it he must run. The ball is dead when it leaves the feeder's hands until it has been struck at by the player, and no one may move from his base while the ball is dead. The players on the "in" side when reduced to two may select one of their number to make what is termed "three hits for a rounder"; the player not selected then retires. The selected one has to be served with the ball until he has had three trial hits thereat, and on the third hit or attempt (if not before) he must run from the home base round to every base in succession, and back again to home, without being hit with the ball and without it being grounded at the home base while he is running. If the round is successfully made, his side is again all "in." If the contrary, the sides change places.

ROUNDFISH. One of the American lake whitefish. See WHITEFISH.

ROUNDHEADS. A name contemptuously used of the English Puritan or Parliamentarian party in the time of Charles I, originating in their fashion of wearing the hair short, while the Cavaliers wore flowing locks.

ROUND POMPANO. See POMPANO.

ROUND TABLE. The name given to the fellowship of knights which gathered around King Arthur, from the table at which they sat. See ARTHUR; MORTE D'ARTHUR; and Tennyson's *Idylls of the King*.

ROUND TOWERS. Tall narrow towers tapering gradually from the base to the summit and found abundantly in Ireland and occasionally in Scotland are among the earliest and most remarkable relics of the ecclesiastical architecture of the British Islands. They are the work of Christian architects and seem to have been in all cases attached to the immediate neighborhood of a church or monastery and were capable of being used as strongholds in times of danger. After the introduction of bells they were also perhaps used as bell towers. They are usually capped by a conical roof and divided into stories, sometimes by yet existing floors of masonry, though oftener the floors were made of wood. Ladders were the means of communication from story to story. There is

generally a small window on each story, and four windows immediately below the conical roof. The door is in nearly all cases a considerable height from the ground. The tower at Devenish, in Ireland, which may be considered as a typical example of the class, is 82 feet high and is furnished with a conical cap. A battlemented crown occasionally supplies the place of the conical roof, and in one instance the base of the tower is octagonal. They are usually assigned to a period ranging from the ninth to the twelfth century. The source of this form of tower has not yet been cleared up. The only group of related examples of earlier data are the round towers of the churches of Ravenna dating from the sixth and seventh centuries, such as those of both basilicas of Sant' Apollinare, of San Vitale, the Cathedral, and Santa Maria Maggiore.

ROUNDWORM, or THREADWORM. A nematode, specifically *Ascaris lumbricoides*, which occurs in the human intestine and resembles an earthworm. It is milk white in color and has three lips which, when pressed down upon the wall of the intestine of its host, form a sucker, in the centre of which is the mouth. The female is larger than the male, sometimes 16 inches long, while the male is 10 or less. The female also seems to be more common. The eggs are very numerous, are fertilized within the body of the mother, and have usually begun their development when laid, but ordinarily pass out of the intestine of the host and remain in a dormant condition until they are finally taken into the alimentary canal of some other human being, probably in most cases by drinking impure water, although eating fresh leaves, fruits, and roots may be an important means. It is said that geographical and climatic conditions have much to do with the frequency of the parasite. For other species of these worms parasitic in domestic animals, see ASCARIS; also THREADWORM.

ROUP, roup *or* rōōp (from *roup, roop*, AS. *hrōpan*, OHG. *hruofan, ruofan*, Ger. *rufen*, Goth. *hrōpjan*, to cry out), CONTAGIOUS CATARRH. DIPHTHERITIC ROUP. A contagious disease of poultry resembling diphtheria in man, but attributed to a different organism. Diphtheritic patches appear on the mucous membrane. The measures to adopt in combating roup are isolation of all affected birds and a thorough disinfection of the premises. The treatment of sick birds requires much time and patience, and there is always the risk that they may carry the contagion for several months after they are apparently well. If the disease proves of a severe type, it is often better to kill the entire flock and after a thorough cleaning and disinfection of the premises to begin with new birds. All birds that have died of roup should be burned or buried. Consult: Harrison and Streit, "Roup," in Ontario Agricultural College and Experiment Station, *Farm Bulletin No. 125* (Ottawa, 1902); Pearl, Surface, and Curtis, "Poultry Diseases and their Treatment," in Maine Experiment Station, *Bulletin* (Orono, 1911); Salmon, "Important Poultry Diseases," in United States Department of Agriculture, *Farmers' Bulletin No. 530* (Washington, 1914); B. F. Kaupp, *Poultry Diseases and their Treatment* (Spartanburg, S. C., 1914); Pearl, Surface, and Curtis, *Diseases of Poultry* (New York, 1915).

ROUS, FRANCIS (1579–1659). An English Puritan and hymnologist. He was born at Dittisham, Devonshire, graduated B.A. at Oxford in January, 1596–97, subsequently at Leyden (1598–99), studied law (1601), but subsequently confined himself to theology. He was an intimate friend of Pym (q.v.), a member of several Parliaments, and supported Cromwell and the Commonwealth. He is remembered for his *Psalms of David in English Meeter* (1643), adopted by the Westminster Assembly and authorized by Parliament for general use.

ROUSAY, rōō'sȧ. One of the Orkney Islands (q.v.).

ROUSE, rous *or* rōōs, WILLIAM HENRY DENHAM (1863–). A British educator, born at Calcutta, India, and educated at Doveton College, Calcutta, and at Christ's College, Cambridge, of which he was a fellow (1888–94). Subsequently he was master at Rugby School (1896–1901), and thereafter head master of the Perse School, Cambridge. During his service at the Perse School he gained prominence by his advocacy of a change in the method of teaching languages, both ancient and modern, by which the teaching and reciting both are done wholly in the language under study. After 1903 he also taught Sanskrit at the University of Cambridge. His publications include: *The Jataka, or Stories of the Buddha's Former Births*, translated from Pali, vol. ii (1895), vol. iv (1901), vol. vi (1907); *Demonstrations in Latin Elegiac Verse* (1898); *Demonstrations in Greek Iambic Verse* (1899); *Greek Votive Offerings* (1902); and numerous school textbooks, written to illustrate his method of teaching languages. In 1907 he became one of the editors of the *Classical Review* (London).

ROUSSEAU, rōō'sō', JEAN BAPTISTE (1670–1741). A French lyric poet, born in Paris. Though a shoemaker's son, he was well educated, enjoying the patronage of Boileau and Breteuil and of Talland, whom he accompanied as secretary to London. He won reputation for stinging satires, directed especially against La Motte and Saurin. La Motte retaliated by compassing Rousseau's defeat in an academic election (1710). Rousseau accused Saurin of circulating libelous epigrams as his own; but he could not legally prove this and was banished (1712). Though called by contemporaries prince of lyrists, he lacks a true lyric spirit. Rousseau's *Works* are in five volumes (Paris, 1820); the poetry in one, edited by Manuel (ib., 1852). The best edition is that of Antoine de Latour, *Œuvres de J. B. Rousseau* (Paris, 1869). Some *Contes inédits* were edited by Luzache (ib., 1881).

ROUSSEAU, JEAN JACQUES (1712–78). One of the greatest French writers of the eighteenth century. He was the son of a watchmaker, Isaac Rousseau, a descendant of a French Huguenot, who had in the seventeenth century emigrated to Geneva to escape religious persecution. Jean Jacques never knew his mother, and was educated first by his father, who made him read mostly sentimental novels, then by an uncle and an aunt, Monsieur and Madame Bernard, who were a little higher than the Rousseaus in the social hierarchy of the Calvinistic city. Family troubles interrupted his education. Jean Jacques became an apprentice to an engraver named Ducommun, by whom he was not well treated, and when 16 he left Geneva to try his fortunes in the Duchy of Savoy. This was Catholic, and its clergy strove to make converts among the children of repub-

lican Switzerland. Rousseau was among these converts. His change of religion was effected at the Maison des Catéchumènes of Turin, whither he had been sent on the advice of Madame de Warens, herself a convert, who was soon to exert a decisive influence upon his destiny. Jean Jacques was for two years a servant in Madame de Vercellis' household, and he acted in a somewhat similar capacity in the Govone family. He also fell in with adventurers of a low type. This led to his return to Annecy, where Madame de Warens resided, and to his admission among her regular companions. She remained the ruling spirit of his life for about 10 years, during which time he was several times engaged in more or less lucrative employments. He left Madame de Warens several times, making trips to Fribourg, Lyons, Paris, and Montpellier. On his return from the last journey he found things so changed in the house, especially owing to the arrival of a newcomer named Wintzenried, that he decided he had better seek his fortunes unaided. The most profitable period of this part of Rousseau's life, as far as his education was concerned, was spent in a small country house not far from Chambéry, whither Madame de Warens had removed from Annecy. In his *Confessions* he has left us a fascinating description both of the place, called Les Charmettes, and of the life he led there, which may be called his honeymoon with Madame de Warens. His intellectual powers and acquirements so developed there that he could a little later occupy the position of resident tutor in the family of the Grand Prieur de Mably.

In 1741 Rousseau arrived in Paris, depending for his fortune upon a new and ingenious system of writing music. He laid his plan before the Royal Academy of Sciences, from which he received praise but no indorsement. Though baffled he had by the bringing forward of his musical investigations gained access to the most intellectual circles of Paris. He soon became a kind of secretary in the family of Madame Dupin, wife of one of the wealthy farmers-general, and her stepson, Monsieur de Francueil, and shortly afterward he was engaged in the same capacity by the Count de Montaigu, who had been appointed Minister of the King of France at Venice. For his new position the knowledge of Italian acquired by him in Turin gave Rousseau special fitness. His employer was unable to understand his young secretary's mental superiority and to avoid inflicting humiliating treatment. Rousseau left him, full of anger, and returned to Paris, where he expected to find justice for himself and punishment for his persecutor, but he soon discovered that for a man of the people to obtain redress for a wrong inflicted by a member of the aristocracy was not possible. This was the first experience that led him to think of the system of social distinctions then in existence and to examine whether any philosophical justification for them existed. He resumed his position near Monsieur de Francueil and mingled more than ever with artists, thinkers, and writers. He wrote for the stage, remodeled for the court of Louis XV, with the consent of the author, Voltaire's dramatic cantata *La Princesse de Navarre*, which he renamed *Les fêtes de Ramire*, and took sides passionately in the conflict then raging in Paris between French and Italian music. He defended the latter in the first of his numerous polemical writings, the *Lettre sur la musique française* (1748). While in contact not only with refined society, but with thinkers like Diderot, D'Alembert, and Grimm, whom he considered in no way his superiors, Rousseau met Thérèse Levasseur, a young woman not above the condition of a servant, and totally illiterate. Without marriage, he made her his permanent companion. Soon he was saddled not only with Thérèse herself, but with her father and mother and the rest of the family. If we may believe Rousseau's *Confessions*, he was fully conscious of the unworthiness of the surroundings thus created by him for himself. He is himself authority for the statement that Thérèse bore him several children and that every one of these children was carried by him immediately after birth to the home for foundlings, though attempts have been made to disprove his disposal of his offspring in this fashion.

Rousseau was now on the eve of celebrity. In 1750 he published a short discourse in answer to the question propounded by the Academy of Dijon, whether the progress of sciences and arts had resulted in making morals purer. He answered negatively with a force of eloquence that won him the prize, and the publication of his paper made him illustrious. An opera, of which he had written both words and music, *Le devin du village*, was performed with great applause first before the court, at Fontainebleau, then at the Paris Opéra. More and more, however, he moved away from the bright Paris circles. He grew displeased with a social order in which he knew that he could not occupy a position in keeping with his mental superiority. This appeared when in 1754 he published his second important work, again an answer to a question propounded by the Academy of Dijon as to the origin of inequality among men and whether it is justified by the law of nature. Of course again his answer was a negative one; but this time, although in style and argument the *Discours sur l'inégalité* was vastly superior to the *Discours sur les sciences et les arts*, the Academy dared not reward him with a prize. Before a society which was a curious blending of autocratic power and aristocratic privileges he had laid the claims of all men to an equal share not only in the government, but in the enjoyment of nature's blessings.

He was henceforth acknowledged a democrat. He would yield no more to aristocratic prejudices. Ambition, however, had not forsaken him. His eyes turned towards his native state, to which he had dedicated his book. He visited Geneva, was welcomed with the highest honors, gave up Catholicism, and thus was allowed to resume his rights as a citizen; and when he left Geneva to return to Paris everybody understood that it was with the intention of soon coming back for good. Rousseau never returned to Geneva. Voltaire soon settled there himself, and Jean Jacques concluded that both could not live near each other in so small a place. His break with society was soon followed by similar treatment of his friends. Diderot and D'Alembert were then publishing their famous *Encyclopédie*, to which Rousseau had originally contributed articles on music and also on political economy. But he had ceased to sympathize with a work the chief doctrine of which was that the happiness of mankind was bound up with the progress of enlightenment, and secretly advocated a society freed from the influence of

the Church. He first moved away from Paris, not far, to the Hermitage, a small house surrounded by woodlands on the estate of La Chevrette, which belonged to his friend, the wealthy and sprightly Madame d'Epinay (1756). But he soon quarreled with Grimm, Diderot, and Madame d'Epinay herself. In December, 1757, he left the Hermitage, where he had been Madame d'Epinay's guest, and moved to the village of Montmorency, near by.

Rousseau's masterpieces were written at the Hermitage and in Montmorency. D'Alembert, acting upon the suggestion of Voltaire, had published in the *Encyclopédie* the article "Geneva," in which he recommends the establishment of a theatre in that city. In reply Rousseau wrote his famous *Lettre à D'Alembert contre les spectacles*, in which he condemns the stage as a school of immorality. This new attack against civilization was followed by *Julie, ou la nouvelle Héloïse* (1760), *Du contrat social* (1762), and his treatise on education, *Emile* (1762). These three works, so different from each other, coming from the same pen in such quick succession, raised him to the front rank of the literary men of his time, with only one left that could be considered his rival, Voltaire. *La nouvelle Héloïse* was mostly written at the Hermitage. Begun simply as an idealized record of his youthful memories, it was suddenly transformed by the ardent and unrewarded passion which he conceived for a sister-in-law of Madame d'Epinay—Madame d'Houdetot. The society of his time was intellectual and spurned sentimentality. Rousseau pleaded for nature, for passion, for love with the energy of a heart ablaze with passion. The success of the book, especially with the feminine public, brought about nothing short of a revolution in the manner of looking upon nature and society. Then came the *Contrat social*, which presented as the ideal and natural government the direct government of the people and which applied the name of sovereign, not to an hereditary monarch, but to the whole body of citizens. Finally, *Emile*, which must not be considered a formal treatise on education, but rather a string of interesting ideas and disquisitions on the subject, again said to the world: Trust to nature. All these teachings, helped by Rousseau's eloquent declamation, told upon society.

Although Monsieur de Malesherbes, the public official in charge of the supervision of new books, had allowed *Emile* to be printed, the Parlement of Paris condemned it and ordered the arrest of the author. Rousseau took refuge at Yverdun, a village belonging to the Republic of Bern. Bern ordered him out of the territory of the Republic. Geneva acted in the same manner and condemned both *Emile* and the *Contrat social*. At last Rousseau found a refuge in the County of Neuchâtel, then belonging to the King of Prussia, and governed in his name by Marshal Keith. There, in the village of Môtiers-Travers, Rousseau spent three peaceful years (1762–65), during which he wrote the letter to Christophe de Beaumont, Archbishop of Paris, by whom he had been openly censured, and the eloquent *Lettres de la montagne*, in which he answered the jurist Tronchin of Geneva, another of his critics.

Another storm came, due to the religious opinions of Rousseau, which were considered too liberal by the powerful clerical authorities of the little Protestant county. Stones were thrown at Rousseau's house. He believed his life in danger. He was then a prey to the idea that the world was making dark plots against him. After another vain attempt to settle within the boundaries of the Republic of Bern, in the island of Saint-Pierre, on the Lake of Bienne, he crossed to England, on the invitation of Hume, as he could not stay in France on account of his condemnation for *Emile*. His sojourn there is marked by his wanton quarrel with Hume and by his writing there a large part of his *Confessions*. In 1767 he left England, still the unfortunate prey to his fixed idea that his friends persecuted him, wandered then for a few years mostly in the south of France, under the false name of Renon, going from one friend's residence to another, and finally in 1770 returned to Paris and settled unmolested in a home, in the Rue Plâtrière, now Rue Jean-Jacques-Rousseau, where he remained for almost two years, periods of comparative peace alternating with periods of profound dejection. He died July 2, 1778, after a four weeks' stay in the Château of Ermenonville, a few miles from Paris, belonging to the Marquis de Girardin. Some ascribed his death to suicide, but the idea is not entertained to-day.

His last works, the *Dialogues*, or *Rousseau juge de Jean Jacques*, and the *Rêveries du promeneur solitaire*, show, one the climax of, and the other the relief from, the mental aberration created in him both by his supersensitive subjectiveness and by the real persecutions that assailed him. There is no good complete edition of Rousseau's works. The best was published at Paris in 1823–26 by Musset-Pathay, in 23 volumes, but it must be supplemented by a number of later publications, never included in the so-called complete editions, notably by the *Œuvres et correspondances inédites* (2 vols.) published at Paris in 1861 by Streckeisen-Moulton. The edition *Hachette* (13 volumes, in very bad print) is the most popular to-day. A *Société Jean Jacques Rousseau*, founded in Geneva in 1904, one of its chief purposes being to bring out a good edition of his works, is still at work on the manuscripts.

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Emile Faguet, *Dixhuitième siècle: études littéraires* (ib., 1890); J. Grand-Carteret, *Rousseau jugé par les Français d'aujourd'hui* (ib., 1890); Joseph Texte, *Jean Jacques Rousseau and the Cosmopolitan Spirit in Literature*, English translation by J. W. Matthews (London, 1899); W. H. Hudson, *Rousseau and Naturalism in Life and Thought* (New York, 1903); Edouard Rod, *L'Affaire Jean Jacques Rousseau* (Paris, 1906); Frederika Macdonald, *Jean Jacques Rousseau: A New Criticism* (2 vols., New York, 1906); P. E. More, in *Shelburne Essays* (6th series, ib., 1909); Edward Caird, in *Essays in Literature* (ib., 1909); Harald Höffding, *Jean Jacques Rousseau et sa philosophie*, translated from the Danish by Jacques de Coussange (Paris, 1912). Educational theories: Hermann Gehrig, *Jean Jacques Rousseau: sein Leben und seine pädagogische Bedeutung* (Neuwied, 1879); Karl Schneider, *Rousseau und Pestalozzi* (2d ed., Berlin, 1881); Thomas Davidson, *Rousseau and Education according to Nature* (New York, 1898); William Boyd, *Educational Theory of Jean Jacques Rousseau* (ib., 1911). The *Annales de la Société J. J. Rousseau* appeared for the first time in 1905 and volumes appear at irregular intervals.

ROUSSEAU, Lovell Harrison (1818–69). An American soldier, born in Stanford, Lincoln Co., Ky. He studied law at Louisville, removed to Bloomfield, Ind., and was admitted to the bar in 1841. In 1844–45 he was a member of the State Legislature. As a captain in the Second Indiana Regiment he fought in the Mexican War, distinguishing himself at Buena Vista. On his return he was elected to the Indiana Senate, but two years later settled in Louisville, Ky. He endeavored to keep Kentucky in the Union, raised the Fifth Kentucky Regiment, of which he was made colonel, and was promoted brigadier general of volunteers in 1861. He served with great credit in the second day's battle at Shiloh and for gallant conduct at Perryville was made a major general of volunteers. Later he commanded the Fifth Division of the Army of the Cumberland at Stone River and at Chickamauga, in 1864 made a destructive raid into Alabama, and had command of Fort Rosecrans under General Thomas in the Nashville campaign. Afterward, while a Republican member of the National House of Representatives, he made an assault upon Josiah B. Grinnell of Iowa, was censured by the House, and resigned, but was reëlected during the following recess. In 1867 he was made a brigadier general in the regular army and was sent to Alaska, where he received the formal transfer of that Territory from Russia.

ROUSSEAU, Philippe (1816–87). A French painter. He was born in Paris and was a pupil of Gros and Victor Bertin. He began as a landscape painter, but later painted chiefly animals, fruits, and flowers, ranking with Chardin, Decamps, and Gillot in depicting monkeys. His painting held the qualities of the Dutch school and was deep, broad, and harmonious in color. Ivory work, metal, or porcelain bowls of glowing fruit, he displayed to perfection against a background of exquisite tone. Among his works are: "Storks Taking a Siesta" and "Kid Nibbling Flowers," both in the Luxembourg; "Breakfast," Valenciennes Museum; "The Monkey Photograph." He also painted excellent decorations in the style of Hondekoeter in private residences and hotels in Paris.

ROUSSEAU, Théodore (1812–67). A French landscape painter, one of the greatest of the Barbizon group. He was born at Paris, April 15, 1812, the son of a well-to-do tradesman. His talent was precocious and at the age of 14 he produced "The Signal Station," which secured for him permission to devote himself to art under Rémond and Lethière. As a pupil of the Ecole des Beaux-Arts he revolted against the prevailing classicism, and though competing for the Prix de Rome in 1831, he produced, instead of the historical landscape set for a subject, "View in Auvergne," that failed of the prize but determined his own independent course. When he next essayed the Salon with his "Descent of the Cows" he found himself, along with Decamps, Delacroix, Champmartin, and other Romanticists, shut out from exhibition. Academic hostility lasted until the reform of the Salon jury in 1848, and the consequence to Rousseau was a bitterness of spirit ill appeased by his final honors. At the Exposition Universelle in 1867 he was made president of the French jury and received the grand medal of honor by the votes of all the juries of the various nations. In 1833 Rousseau took up his abode at Barbizon, where he spent most of his remaining life. He visited Brittany in 1837 and painted his "Avenue of Chestnuts"; he also painted in the Ile de France and in Berry and Gascony, but few characteristic features of the forest of Fontainebleau escaped his notice. He was a recluse from society, married to a peasant woman who became stricken with insanity and whom he tenderly cared for. On Dec. 20, 1867, he succumbed to paralysis, attended to the last by the painter Millet, his most intimate friend. A distinguishing characteristic of Rousseau's art is the remarkable balance of intellectual and emotional qualities. He has well been called the epic poet of landscape art, for he painted every phase of nature. He preferred, indeed, the most solid features of the landscape—the vigor of oak and beech tree, the structural emplacement of rock and hills, the serene placidity of water and plain. Always a good and careful draftsman, his early pictures show almost an overinsistence on details; the eye is carried back into remote reaches of distance, from point to point of subtly developed planes. But he never sacrificed breadth and harmony of color.

Rousseau is best represented in the Louvre, which possesses in all 18 examples. The most important are: "The Oaks," "The Plain," "Spring," "Avenue through the Forest," "L'Isle Adam," "The Foot Bridge," and "Pond near the Road, Berry"; also the well-known "Landscape after Rain," "Edge of the Forest of Fontainebleau," and "Fens in the Landes." The Metropolitan Museum, New York, ranks next to the Louvre in the importance of its collection, with 13 examples, including "Edge of the Forest" and the "Gorge of Apremont, Evening" (both in the Vanderbilt collection), "Path through the Rocks," and "Entrance to the Forest of Fontainebleau." Rousseau is well represented also in some of the American private collections, as in the Waters collection, Baltimore, with the well-known painting "Frost, Winter Solitude" and two others.

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(New York, 1902); *Masters in Art*, vol. viii (Boston, 1907); John La Farge, *Higher Life in Art* (New York, 1908).

ROUSSEL, rōō'sĕl', Gérard (c.1480–1550). A French reformer, born near Amiens. He was an intimate friend of Lefèvre d'Etaples (see Faber) and, like him, embraced the Reformation with the view that he could do so without separating himself from the Catholic church. But persecution followed him and he went to Strassburg (1525). The next year the Queen of Navarre, Marguerite d'Angoulême, made him her confessor, and under her powerful protection and patronage he lived securely. She had him appointed to the bishopric of Oléron (1536). Early in 1550, while preaching at Mauléon against the excessive number of ecclesiastical festivals, he was fatally injured by a fanatic. In the year of his death his *Familière exposition* was condemned by the Sorbonne because of its Protestant views. Consult his *Life* by Charles Schmidt (Strassburg, 1845) and the letters and notes given by Hermingard, *Correspondance des réformés* (2d ed., Paris, 1878).

ROUSSELAERE, rou'se-lär. See Roulers.

ROUSSELIN, rụs'lăn', Jean. See Roscelinus.

ROUSSELOT, rōō-se-lō', Abbé Jean Pierre (1846–). A French phonetician, born at Saint-Cloud (Charente). In 1865 he entered the seminary of Angoulême, where he taught (1869–71). He then became vicar at Cognac and curate of Jarrezac (1871–73), but continued his studies under Gaston Paris and Paul Meyer (qq.v.) at the University of Paris, receiving the degree of doctor of letters in 1892. In 1887 he had become assistant professor of French philology at the Catholic Institute of Paris and two years later he opened the first course of experimental phonetics ever established. In 1897 he was appointed director of the laboratory of experimental phonetics at the Collège de France, the plan for which originated with him. Rousselot invented many phonetic instruments and made important discoveries tending to cure deafness, stuttering, and similar afflictions. Among his works the most important are: *De Vocabulorum Congruentia in Rustico Cellæ-Fruini Sermone* (1892; Fr. trans., 1892–93), his doctoral dissertation; *Précis de prononciation française* (1902), with Laclotte; *Principes de phonétique expérimentale* (2 vols., 1901–08); *Premiers éléments de prononciation française* (1903), with Laclotte. From 1887 to 1893 he was editor of the *Revue des Patois Gallo-Romans*.

ROUSSET, rōō'sâ', Camille Félix Michel (1821–92). A French historian, born in Paris. He became professor of history at Grenoble in 1843, and from 1845 to 1863 held the chair of history at the Collège Bourbon in Paris. In 1864 he was appointed historiographer and librarian to the Minister of War, a post which he held until 1876. He was elected to the French Academy on Dec. 30, 1871. Among his works the following deserve mention: *Précis d'histoire de la Révolution française* (1849); *Histoire de Louvois et de son administration politique et militaire* (1861–63); *Les volontaires de 1791–94* (1870); *Histoire de la guerre de Crimée* (1877); *La conquête d'Alger* (1879); *Les commencements d'une conquête* (1887).

ROUSSILLE, rōō'sēl', Marie Angélique de Scoraille de. See Fontanges, Duchesse de.

ROUSSILLON, rōō'sē'yôn'. Formerly a province of south France, lying between Languedoc, Foix, the Pyrenees, and the Mediterranean; now comprised within the Department of Pyrénées-Orientales. Its capital was Perpignan (q.v.). Its ancient inhabitants were the Cardones, whose capital, Ruscino, gave the country its name. From the Romans the region passed, about 460, to the Visigoths and in 720 it was conquered by the Arabs. The Franks conquered it in 759. Under the Carolingians it was ruled by counts who, about 900, succeeded in establishing their independence. In 1172 Roussillon was acquired by Aragon and in 1642 it was wrested from Spain by Louis XIII of France. It was definitely ceded to France by the Peace of the Pyrenees (1659).

ROUSSY, rōō'sē', Girodet de. See Girodet-Trioson, A. L.

ROUT. See Riot.

ROUTH, routh, Edward John (1831–1907). A British mathematician, born in Quebec, Canada. He graduated at London University in 1847 and at Peterhouse, Cambridge, in 1854, and until 1888 was a tutor. From 1857 to 1864 he was a fellow of Peterhouse. Both in London and in Cambridge universities he was long an examiner. He published *An Analytical View of Newton's Principia* (1855), with Lord Brougham; *Essay on the Stability of a Given State of Motion* (1877); *Treatise on Rigid Dynamics* (2 vols., 1860; 7th ed., rev., 1905; Ger. trans., 1898); *Treatise on Analytical Statics* (2 vols., 1891; 2d ed., 1896–1902); *Dynamics of a Particle* (1898).

ROUTH, Martin Joseph (1755–1854). An English scholar and educator, born in South Elmham, Suffolk, and educated at Queen's and Magdalen colleges, Oxford. Elected president of Magdalen in 1791, he held that post for 63 years. In 1810 he received priest's orders. Routh lived into his one hundredth year with no impairment of his mind and little of body. He was an especial authority on ecclesiastical law and history. He published editions of Plato's *Euthydemus* and *Gorgias* (1784); *Reliquiæ Sacræ Secundi Tertiique Sæculi post Christum* (1814–18); Burnet's *History* (1823) and *History of the Reign of James II* (1852); *Scriptorum Ecclesiasticorum Opuscula Quædam* (1832); *Tres Breves Tractatus* (1853). Consult the sketch in Burgon's *Lives of Twelve Good Men* (London, 2d ed., 1888).

ROUTHIER, rōō'tyâ', Sir Adolphe Basile (1839–). A Canadian jurist and author, born at Saint-Placide, Province of Quebec. He graduated in 1858 at Laval University, Quebec, was admitted to the bar in 1861, practiced at Kamouraska, was twice an unsuccessful Conservative candidate for Parliament, in 1873 became a puisne judge of the Superior Court of Quebec province, and was Chief Justice of that court in 1904–06, retiring in the latter year. In 1897–1906 he was also a judge of the Vice-Admiralty Court of Quebec. Routhier served as professor of international law in Laval University. In 1911 he was knighted and in 1914 he was elected president of the Royal Society of Canada. Previous to his appearance on the bench he was active as a journalist. He published several volumes, including *A travers l'Europe* (1882–83); *Les échos* (1883), a collection of verse; *Les grandes drames* (1889); *Conférences et discours* (1890); *De Québec à Victoria* (1893); *Québec* (1909); *The Centurion: A Romance of the Time of the Messiah* (1910), translated by L. B. Borden.

ROUTLEDGE, rout'lĕj, GEORGE (1812–88). The founder of the London publishing firm now styled George Routledge and Sons. He was born at Brampton, Cumberland. After serving his apprenticeship with a bookseller at Carlisle, he went to London (1833), and after three years opened a shop of his own (1836). In 1843 he began publishing. Routledge was a pioneer in publishing cheap books, especially of American authors, for the masses. Among his successful ventures are the Railway Library (1848 et seq.), leading off with Cooper and numbering over 1000 volumes; Routledge's Universal Library, edited by Henry Morley (60 vols., 1883 et seq.); and editions of Irving, Cooper, Ainsworth, Bulwer, etc. Of *Uncle Tom's Cabin* he sold 500,000.

ROUVIER, rōō'vyā', MAURICE (1842–1911). A French politician, born at Aix. He studied law and became an advocate at Marseilles. In politics he was a Republican; he attacked the Empire in opposition journals and in the National Assembly. In 1881–82, during the premiership of Gambetta, he was Minister of Commerce and the Colonies and he held the portfolio of Commerce also in 1884–85. From May to December, 1887, he was at the head of a cabinet in which he also was Minister of Finance. He received the portfolio of Finance (1889) in the Tirard ministry and retained it until he withdrew in 1892 in consequence of his implication in the Panama affair. In 1902 he became once more Minister of Finance, in the Combes cabinet. On the fall of the cabinet in 1905 he became Premier. In his administration occurred a serious crisis with Germany over Morocco and the enactment of the law for the separation of the churches and the state. See FRANCE.

ROUVILLE, FRANCIS HERTEL DE. See HERTEL DE ROUVILLE, FRANCIS.

ROUVROY, LOUIS DE, DUKE OF SAINT-SIMON. See SAINT-SIMON, DUKE OF.

ROUX, rōō, PIERRE PAUL EMILE (1853–). A French physician and bacteriologist, born at Confolens (Charente). He studied medicine at Clermont-Ferrand (Puy-de-Dôme) and at Paris, where from 1874 to 1878 he held a subordinate post in the Faculty of Science. In 1878 he entered the laboratory of Pasteur, becoming assistant director in 1896 and in 1904 director of the Pasteur Institute. In 1895 Roux was elected to the Academy of Medicine and in 1899 to the Academy of Sciences, and from the Institute he received the prix Osiris of $20,000 in 1903. He assisted Pasteur in various experiments, including those concerning the ætiology of carbon and the preventive treatment of hydrophobia. He also conducted researches with Nocard regarding pneumonia, among the results of which was the discovery of the pneumonia microbe; but is best known through his studies on diphtheria and the diphtheria toxin (with Yersin, 1889). His papers are published in the *Annales de l'Institut Pasteur* (Paris).

ROUX, WILHELM (1850–). A German physiologist and anatomist, born at Jena. He studied at Jena, Berlin, and Strassburg universities and in 1886 became assistant professor at Breslau. In 1889 he was called to the chair of anatomy at Innsbruck and in 1895 received a similar appointment at Halle. His particular researches were in connection with the science of Entwicklungsmechanik—the influence upon physical development of the mechanical demands made upon various organs. He wrote, among other works: *Der Kampf der Teile im Organismus* (1881), in which he laid down his theory of adaptation of parts of the organism to a change in functions, treating the same subject two years later in *Beiträge zur Morphologie der funktionellen Anpassung; Gesammelte Abhandlungen über die Entwickelungsmechanik der Organismen* (1895); *Die vier causalen Hauptperioden der Ontogenese* (1911). In 1894 he founded the *Archiv für Entwickelungsmechanik.*

ROVE BEETLE. Any representative of the Staphylinidæ, one of the largest families of beetles. The body is long and slender, while the wings are very short, well developed, and when not in use are folded under the short wing covers. The abdomen is soft and flexible, and these insects have a habit of turning up the point of it, particularly when annoyed, whence the English name, cocktail. Their food is carrion of different kinds, and some will feed upon living insects as well as dead ones, and probably on fungi. Many of them have a fetid odor. About 9000 species have been described, 1000 of which occur in North America. A very large

A ROVE BEETLE.

and powerful species lives in the nests of wasps and hornets. Other species live in the nests of termites.

ROVERE, rō'vā-rā, COUNT MAMIANI DELLA. See MAMIANI, TERENZIO, COUNT DELLA ROVERE.

ROVEREDO, rō've-rā'dō, or ROVERETO (Ger. *Rofreit*). A town in south Tirol, Austria, picturesquely situated on the Leno, 15 miles by rail south-southwest of Trent (Map: Austria, B 4). Roveredo is the centre of the Tyrolese silk trade. It manufactures leather, paper goods, and strings for musical instruments, and trades in wines, cereals, hams, and fruits. Near by is a castle where Dante sojourned. Roveredo belonged to Venice in the fifteenth century. Pop., 1900, 10,180; 1910, 11,655, mostly Italians. It was captured by the Italians in the Great War which began in 1914. See WAR IN EUROPE.

ROVETO, rō-vā'tō. See ESCOLAR.

ROVIGNO, rō-vē'nyō (Lat. *Arupenum, Rubinum*). A seaport in the Crownland of Istria, Austria, situated on a rocky promontory in the Adriatic, 40 miles south of Triest (Map: Austria, C 4). It contains a cathedral and an important zoölogical garden. Rovigno is famous for its wine, hazelnuts, and olive oil. There are shipbuilding yards, a large tobacco factory, and tunny and sardine fisheries. The inhabitants are famous as pilots. Pop., 1900, 10,205; 1910, 12,325, mostly Italians.

ROVIGO, rō-vē'gō. The capital of the Province of Rovigo, Italy, situated on the Adigetto, 38 miles southwest of Venice (Map: Italy, C 2). Its ancient walls and towers and the ruins of an old castle are still to be seen. There are a town hall with a picture gallery and a library of 80,000 volumes, a Gymnasium, a lyceum, and a technical school. In the Middle Ages Rovigo belonged to Venice. Pop. (commune), 1901, 11,174; 1911, 12,224.

ROVIGO, Duke of. See Savary, Anne Jean Marie René.

ROVING. See Spinning.

ROVNO, rôv'nô. A fortified town in the Government of Volhynia, Russia, situated on two important railway lines, 115 miles west-northwest of Zhitomir (Map: Russia, C 4). It has some flour mills and trades in grain, cattle, and wood. It belongs to the counts of Lubomirski. Pop., 1897, 24,905; 1911, 39,073, mostly Jews.

ROV'SING, (Niels) Thorkild (1862–). A Danish surgeon, born at Flensborg. He graduated in 1885 from Copenhagen University, where in 1889 he received the degree of M.D. and was appointed professor of clinical surgery. His contributions to abdominal surgery, and especially "Rovsing's symptom" in appendicular inflammation, are important. He published: *Urinorganernes Chirurgi fremstillet* (3 vols., 1895–99); *Kliniske og experimentelle Studier over Urinorganernes infectiose Sygdomme* (1897; Ger. trans., 1898); *Underlivskirurgi*, vol. i (1910; Ger trans., 1912; Eng. trans., *Abdominal Surgery*, 1912).

ROVUMA, rô-vōō'mȧ. A river of east Central Africa (Map: Congo, H 5). It rises in the Livingstone Mountains, which extend along the east shore of Lake Nyassa, and flows eastward into the Indian Ocean. Its length is about 400 miles. About halfway to its source it receives the Lujenda, a rapid and shallow stream. Below the confluence the Rovuma is navigable during the wet season for river craft of considerable size. The river was first explored in 1861 by Livingstone.

ROWAN, rō'an, Stephen Clegg (1808–90). An American naval officer. He was born near Dublin, Ireland, but emigrated to America with his parents at an early age and settled in Ohio. In 1826 he was appointed midshipman in the navy. In the Mexican War, as executive officer of the *Cyane*, he assisted in the capture of Monterey and San Diego and in the attack on Guaymas. He saw service in the Mexican War, and the outbreak of the Civil War found him in command of the *Pawnee*. With that vessel he protected Washington for a time and covered the Federal force in Alexandria, and on May 25, 1861, engaged a Confederate battery at Acquia Creek, thus fighting the first naval action of the war. On February 10, as commander of the *Delaware* and a flotilla of other vessels, he pursued the Confederate fleet into Pasquotank River, captured it, and destroyed the fortifications on shore. He then passed on up the river, seized Elizabeth City and Edenton, and obstructed the Chesapeake and Albemarle Canal. In March, 1862, he coöperated with General Burnside in the capture of Winston, Newbern, and Beaufort. For his services Rowan was promoted first to be captain and afterward to be commodore. He was in command of the *New Ironsides* off Charleston and in the absence of Admiral Dahlgren was in command of the entire blockading squadron. In 1866 he was made a rear admiral, in 1868–70 commanded the Asiatic squadron, and in the latter year was advanced to the rank of vice admiral. He retired in 1889. Consult an article by Admiral Stevens in Hamersly's *Naval Encyclopædia* (Philadelphia, 1881, 1884), and Johnson and Buel (eds.), *Battles and Leaders of the Civil War* (New York, 1887).

ROWAN (rō'an *or* rou'an) **TREE** (*Pyrus Aucuparia*). See Mountain Ash.

ROWE, rō, Leo S(tanton) (1871–). An American economist, born at McGregor, Iowa. He was educated at the University of Pennsylvania (Ph.B., 1890), where, after further study at the University of Halle (Ph.D., 1892), he was instructor in municipal government (1895–96), assistant professor of political science (1896–1904), and thenceforth head professor. He obtained also the degree of LL.B. at Pennsylvania in 1895 and was admitted to the bar. He was a member of the Commission to Revise and Compile the Laws of Porto Rico in 1900–01 and chairman of the Insular Code Commission in 1901–02—these commissions reported codes which were, with some modifications, adopted as the law of Porto Rico. In 1906 Rowe was United States delegate to the Third International Conference of American States, served as chairman of the American delegation to the First Pan-American Scientific Congress in 1908–09, and in 1913 was a member of the United States and Panama Joint Claims Commission. After 1902 he held the presidency of the American Academy of Political and Social Science. His writings include *The United States and Porto Rico* (1904) and *Problems of City Government* (1908).

ROWE, Nicholas (1674–1718). An English dramatist and poet laureate, born at Little Barford, Bedfordshire. He was educated at Westminster and studied law in the Middle Temple, but devoted himself to literature. Between 1700 and 1715 he brought forth eight plays, of which three were long popular: *Tamerlane* (1702), *The Fair Penitent* (1703), and *Jane Shore* (1714). The character of Lothario in *The Fair Penitent* is the prototype of Lovelace in Richardson's *Clarissa Harlowe*. Perhaps Rowe is now best known for his critical edition of Shakespeare (6 vols., 1709; rev., 8 vols., 1714), really the first critical edition. The Duke of Queensberry made him Undersecretary of State. In 1715 he succeeded Tate as poet laureate. He was buried in Westminster Abbey. After his death appeared his complete verse translation of Lucan's *Pharsalia* (1718).

ROWELL, rou'el, Newton Wesley (1867–). A Canadian lawyer and statesman, born in Middlesex County, Ontario. Called to the bar in 1891, he practiced in Toronto, becoming a leader in his profession in Ontario. In 1911 his ability as a lawyer and political speaker made him leader of the Liberal Opposition in the Ontario Legislature, to which he was elected the same year. In the provincial elections in 1914 he led his party in a notable though unsuccessful attempt to abolish the barrooms of Ontario.

ROWEN, rou'en. See Hay.

ROWENA, rō-ē'nȧ. In Scott's *Ivanhoe*, the ward of Cedric the Saxon and the successful rival of Rebecca for Ivanhoe's love.

ROWING (from *row*, AS. *rōwan*, Icel. *rōa*, to row; connected with OIr. *rāme*, Lat. *remus*, Gk. *ἐρετμόν, eretmón*, oar, Skt. *aritra*, rudder, paddle, and ultimately with Eng. *rudder*, oar). The art of propelling a boat by oars. Professional boating is almost exclusively single sculling, which will be found treated separately. This article is, therefore, confined to fresh-water rowing in competitive races, by crews mostly of eight men, though occasionally of four, and more rarely of two.

The boats are light, long, and narrow. The English custom in an eight-crew boat is to seat each man as far over to the opposite side from his rowlock as possible, so that, in effect, four

sit on one side and four on the other. In America the men sit in a straight line down the centre. In eights the boat is kept in its course by a steersman (coxswain), sitting in the stern and guiding with tiller ropes attached to the rudder. In fours, however, it is usual to dispense with a steerer, the first rower from the stern keeping the boat in position by pressing with his feet a board to which rudder lines are attached. Pairs dispense with a rudder. The styles of rowing differ with place and period, and each has advocates. But there is one fundamental principle governing the subject: what the oar does in the water is the only thing that gives pace to a boat. *The swing forward* is to put the oar, held horizontally so as to minimize the resistance of the atmosphere, back beyond the rowlock, so that when turned on edge it may drop into the water at the most effectual spot. *The beginning* is the applying the whole weight of the body against the water in front of the blade. *The swing back* carries the blade onward. *The finish* is when the body has passed the perpendicular, and *the recovery* is when the oar is lifted out of the water by the rower lowering his hands, when the swing forward for another stroke begins.

The boats have had an interesting development in the aim to combine lightness and strength. In the early days they were heavy, wide, and deep, with a keel and with rowlocks or ruts for the oars on their gunwales. The first decided innovation was that of Clasper, a celebrated Oxford builder, who in 1845 designed light iron brackets (outriggers) extending out from the sides of the boat. These enabled the rowlock to be at a point farther out than before from the rower's hand and thereby increased the power of his stroke. They were adopted both in England and by Yale and Harvard. The next improvement was in 1856, when the first keelless boat was built in England by Matt Taylor. This was a revolution necessitating a new method of rowing; in fact modern rowing styles all date from that event. The sliding seat, introduced by Yale in 1870, was the next and remains practically the last of the steps in the evolution of the mechanism of the rowing boat. It necessitated the use of a longer leverage of the oar inboard, but it did not require any material alterations in methods of rowing. It was improved and by 1872 was in use in England as well as in America.

The boat of a racing eight is approximately 60 feet long, 2 feet wide, and 1 foot deep. The slide varies in length, but is usually about 20 inches in American boats and about 16 inches in English boats. The distance of the rowlock from the centre of the seat also varies. Thirty inches is the average distance in England, where fixed rowlocks are used, and practically the same distance is allowed in American boats. In America the rowlocks work on a swivel. The material of the boat in Great Britain has nearly uniformly been cedar, and this wood is much used in the United States, although papier-mâché and aluminium have been tried with success under suitable conditions. Expert boat builders seem to prefer cedar. The oars of America are lighter and of a different shape from those in use in England and wider, ranging from 6½ to 7¼ inches across the blade. A standard English length is 12 feet, 6 inches over all, buttoned for the rowlock at 3 feet, 8 inches from the handle end, and 5½ inches wide in the blade, although the oar must be accommodated to the individual oarsman.

In all probability competitive rowing owes its origin to the Thames watermen. The Windsor watermen of the royal barge and their aquatic contests would naturally interest the Eton boys directly across the Thames, so that it is not surprising to find the earliest instance of a rowing club at Eton. Its list of captains is complete from the year 1812, although its operations extend into the previous century. Since then Eton has been the nursery of the best oarsmen of both the ancient English universities. According to Mr. Rudolph Lehmann (whose carefully prepared book is cited below), "college boat racing was in existence at Oxford in 1815, and probably some years before that," and "at Cambridge in 1826, and probably a year or two before that." The first English club not located at a public school or university was the Leander Boat Club, on the Thames. There are no authentic records to show just when this famous club was organized, but Mr. Lehmann says that it was founded "probably in 1818 or 1819." Its influence on rowing has been of the first importance, and to-day its crews hold the premier honors of the rowing world. The Australian Rowing Association, founded in 1879, is the governing body for general rowing in Australia.

Rowing in the United States. American boating has been advanced by the colleges, whose crews represent the most finished watermanship and hold nearly all the records for the distances and conditions in which they compete. These contests between colleges represent, also, clean and well-conducted sport. Rowing began in the United States early in the nineteenth century, and the first important race was held in 1811, when a New York City crew, rowing in a four-oared barge, defeated a Long Island crew. By 1833 rowing was fairly well established at Yale, and 10 years later the Yale Boat Club was organized, with a four-oared crew. The oldest boat club in the country is the Detroit Boat Club, founded in 1839. Rowing at Harvard had been organized as early as 1839. Serious boat racing began with intercollegiate boating, nine years after the formation of the Yale Boat Club, and its history ever since has been intimately connected with collegiate athletics. The first intercollegiate regatta was held on Lake Winnepesaukee, N. H., in 1852, Yale and Harvard then being the only boating colleges. Harvard won the race and also a second one, which was held in 1855 on the Connecticut, at Springfield, Mass. In 1857 was built for Harvard the first racing shell, a six-oared boat, 40 feet long, and weighing 150 pounds. In 1858, at the suggestion of Harvard, the Union College Regatta Association was formed, composed of Harvard, Yale, Trinity, and Brown. Harvard won all the races of this association, which dissolved upon the breaking out of the Civil War. There were no races during the early years of the war, but in 1864–70 Yale and Harvard met in six-oared barge races, and Harvard won five of the seven contests. In 1869 Harvard sent to England the first American crew, which was beaten on the Oxford-Thames course. In 1871 the famous Rowing Association of American Colleges was formed, having at one period 16 members. In the six annual regattas held by this association the Massachusetts Agricultural College, Amherst, Yale, and Columbia won in the four-oared races. Cornell won the last two. Yale refused to row in 1876 and competed instead with Harvard in a dual race, the first in the Harvard-Yale series in eights for 4 miles.

Harvard competed in both races that year, but it was the last regatta held by the Intercollegiate Association, which then ceased to exist.

With Harvard and Yale rowing together, a few of the remaining colleges competed in various combinations until 1883, when for the third time an intercollegiate association was formed by Bowdoin, Columbia, Cornell, Princeton, Rutgers, University of Pennsylvania, and Wesleyan, rowing in four-oared shells over a 1½-mile course. In 1883, also, Cornell and Pennsylvania met for the first time and have competed annually ever since, either in dual races or at the larger regattas. In 1895 the present Intercollegiate Association was formed by Cornell, Columbia, and Pennsylvania, with whom the management rests, and the entry of Wisconsin, and especially (in 1915) of Leland Stanford Junior, whose fine crew took second place in the varsity race, has added greatly to the interest of these events.

The entrance of Harvard in the regatta of 1896 is connected with one of the most notable chapters in intercollegiate rowing history. In 1896–97 Cornell and Harvard had a dual agreement in athletics. Harvard had dropped all relations with Yale, owing to a serious athletic rupture, and while Yale rowed at Henley (England), Harvard competed in the Poughkeepsie races. In 1897 Harvard resumed relations with Yale, and, having an engagement to meet Cornell and not wishing to row two races, suggested that Yale be admitted to the Harvard-Cornell race. Cornell agreed, but suggested in turn that Columbia and Pennsylvania be also admitted. This Yale refused to consider, on the grounds that the race would be unwieldy. Cornell was unwilling to forsake Pennsylvania and Columbia. At the same time she was anxious to compete with the New Haven university, whom she had not met on the water since 1875, except in a freshman race in 1890. As a result Cornell rowed in two regattas in 1897 and again in 1898, defeating Yale and Harvard both times. In the latter year, however, the races were rowed in different places, within a week of one another, and Cornell in the intercollegiate regatta lost to Pennsylvania. This was her first serious defeat, with one exception, in 14 years. In 1899 Cornell declined the invitation of Harvard and Yale to row in their dual race, but expressed herself as willing to meet them as competitors in the Intercollegiate Regatta. It has been the aim of the Intercollegiate Association to make its regatta a representative meeting of American boating colleges. A four-oared varsity race was added in 1899 to the regular varsity and freshman events in eights, and in 1900 pair-oared and single events were provided for in case of three entries in each race.

From 1900 to 1915, of the varsity races (at Poughkeepsie) Cornell won 11, Syracuse 3 (1904, 1908, 1913), Pennsylvania 1 (1900), and Columbia 1 (1914). In 1915 the world's record for the 4-mile, eight-oared varsity race was 18 minutes, 53⅕ seconds, made by Cornell at Poughkeepsie in 1901.

The formation of the American Association of Amateur Oarsmen in 1871, as the governing rowing association of the United States, was the first satisfactory step towards the enforcement, outside of the colleges, of rules for amateur rowing, although an amateur standard had been recognized in a way some 30 years before, when the Castle Garden Boat Club Association was formed. The association has held annual regattas at various places, with singles, doubles, pair-oared, four-oared, and eight-oared events. In Canada an association of amateur oarsmen was formed in 1870; it holds annual championship regattas.

There have been several international rowing contests, e.g.: 1869—Harvard varsity four against Oxford, over the Thames course, from Putney to Mortlake, lost by six seconds. 1876—London Rowing Club four, on the Schuylkill River course at the United States Centennial Regatta, defeated a Yale four. 1878—Columbia varsity four won the Visitors' Cup at Henley. 1881—Cornell varsity four lost at Henley. 1882—The Hillsdale crew rowed against the Thames Rowing Club and lost by reason of the bow oarsman breaking his oar. 1895—Cornell varsity eight entered for the Grand Challenge Cup at Henley and won the first heat from Leander, which failed to start, owing to a misunderstanding, but was defeated by Trinity Hall, Cambridge. 1896—Yale varsity eight entered for Grand Challenge Cup at Henley and were defeated by Leander, 1901—University of Pennsylvania eight at Henley won the first heat over London Rowing Club, the second heat over Thames Rowing Club, but lost the final heat to the Leander club by one length. 1906—Harvard varsity eight against Cambridge, over the Thames course, from Putney to Mortlake, lost to Cambridge by two lengths. 1914—Harvard junior varsity eight won the Henley regatta by defeating the Union Boat Club of Boston (made up of former Harvard oarsmen) after having beaten the Winnipeg Rowing Club in the semifinals.

Consult: Whitney, *A Sporting Pilgrimage* (New York, 1895); R. C. Lehmann, *Boating*, in Isthmian Library (London, 1897); Crowther and Ruhl, *Rowing and Track Athletics* (ib., 1905); A. W. Stevens, *Practical Rowing with Scull and Sweep* (Boston, 1906); R. C. Lehmann, *Complete Oarsman* (New York, 1908); "Rowing," in *Encyclopædia of Sports and Games* (new ed., London, 1911). See Henley Regatta, and Plate of Lacrosse and Sculling.

ROWLAND, rō'land, Henry Augustus (1848–1901). An American physicist, born at Honesdale, Pa., Nov. 27, 1848. He studied civil engineering at Rensselaer Polytechnic Institute, Troy, where he graduated in 1870, and from 1876 till his death was professor of physics at Johns Hopkins University. Professor Rowland was one of the greatest physicists of the nineteenth century. His determination of the mechanical equivalent of heat was one of his most important investigations. His determination of the ohm was likewise of great value, and his study of the magnetic properties of iron led to entirely new conceptions of magnetism. His interest in spectroscopy led him to the discovery of the principle of the concave grating and to the construction of a dividing engine provided with a screw of extreme accuracy and uniformity of pitch, by which gratings were prepared under his direction. Rowland not only made an eye study of the spectrum, but also applied photographic methods. He investigated the solar spectrum and the arc spectra of various elements and carried on many researches in allied fields. His work on alternating currents and their application has also been of importance. One of his last investigations resulted in the development of a system of multiplex telegraphy based on the use of synchronous motors, for which he received a gold medal from the Paris Exhi-

bition. Perhaps his most important discovery was that of the magnetic effect of electric convection, which has a widespread theoretical bearing upon electrical phenomena. At the time of his death (April 16, 1901) Professor Rowland was the president of the American Physical Society, of which he was one of the founders. Some of his important researches are the following: *On Magnetic Permeability* (1873); *On the Magnetic Permeability and Maximum Magnetization of Nickel and Cobalt* (1874); *Studies on Magnetic Distribution* (1875); *On a Magnetic Effect of Electric Connection* (1876); *Research on the Absolute Unit of Electrical Resistance* (1878); *On the Mechanical Equivalent of Heat* (1880); *On Concave Gratings for Optical Purposes* (1883); *On the Relative Wave Lengths at the Lines of the Solar Spectrum* (1886). His collected physical papers were published by the Johns Hopkins Press in 1902, with biographical sketch by Prof. T. C. Mendenhall. Consult also D. S. Jordan, in *Leading American Men of Science* (New York, 1910).

ROWLANDS, Richard. See Verstegen, R.

ROWLANDS, rō'landz, Samuel (c.1570–?1630). An English author, who published about 25 famous pamphlets in prose and verse. Some are on religious themes, but most are satires on contemporary manners. The series began with *The Betraying of Christ* (1598), a poem, and closed with *Heavens Glory, Seeke it: Earts Vanitie, Flye it: Hells Horror, Fere it* (1628), in verse and prose. Of his satirical work, a good specimen is *The Letting of Humours Blood in the Head-Vaine* (1600), a collection of satires and epigrams, assailing his contemporaries under fictitious names. To the same year belongs the similar *A Mery Metinge, or 'tis Mery when Knaves mete.* Both these pamphlets were burned by the authorities, and the publishers were fined for handling them. *Martin Mark-all, Beadle of Bridewell* (1610) is an excellent account of the rogues of the time. Consult the reprint of his *Works,* with an introduction by Gosse (Hunterian Club, Glasgow, 1872–86).

ROWLANDSON, rō'land-son, Mary. An English colonist of the seventeenth century, famous for one book. She was the wife of the first minister of Lancaster, Mass. On Feb. 10, 1675 (or 1676?), Lancaster was destroyed by the Indians, who carried off Mrs. Rowlandson and her children. After her release three months later appeared her book, called *Narrative of the Captivity and Removes of Mrs. Rowlandson among the Indians* (London, 1682; Boston, 1720. Reprinted in *Narratives of the Indian Wars,* ed. by C. H. Lincoln, New York, 1913). She tells of her sufferings, of her child's death by cold, and of her sale by her Narraganset captor to an Indian chief. She was at last ransomed for about $80, a sum raised by several women of Boston. Her book went through various editions.

ROWLANDSON, Thomas (1756–1827). An English caricaturist, painter, and illustrator. He was born in Old Jewry, London, and studied at the Royal Academy and in Paris. After gambling away a fortune, he commenced in London to paint portraits and landscapes. These were exhibited with much success at the Royal Academy. He then turned to caricature and illustration, first gaining success with a drawing of Vauxhall Gardens. Rowlandson drew every phase of the English life of his day. He possessed vitality, keen observation, an inexhaustible imagination, a sense of design, and great facility, but was often careless in execution. His more serious drawings and water colors also reveal a sense of the beautiful and the picturesque. As a caricaturist he is powerful, but coarse and bitter. His most popular works are the series entitled "Tours of Dr. Syntax" (1812, 1820, 1821), "The English Dance of Death" (1815–16), and "The Dance of Life" (1817), all with text by William Coombe. His work was chiefly in pen-and-ink, lightly washed or retouched in water colors. Among his illustrations are those for *The Vicar of Wakefield* and *Baron Munchausen.* Characteristic drawings are in the British Museum, the South Kensington Museum, and the Metropolitan Museum, New York. Consult Grego, *Rowlandson the Caricaturist* (London, 1880).

ROWLEE, rou'lē, Willard Winfield (1861–). An American botanist, born at Fulton, N. Y., and educated at Cornell (LL.B., 1888; Sc.D., 1893), where he served as instructor (1888–93), assistant professor (1893–1905), and thenceforth professor of botany. His researches deal with the flora of the United States, with North American willows, and with the comparative anatomy of woods. He is author of *Lieutenant Heman Rowlee (1746–1818) and his Descendants* (1907).

ROWLEY, rō'lī, William (c.1585–c.1642). An English actor and dramatist about whom very little is known. He was connected with the Prince of Wales's company of actors and collaborated on many plays with Middleton and other dramatists. He gave up acting about 1627. In the comedy of humors and of manners which was characteristic of the first half of the seventeenth century he succeeded partly by an effective, if not highly artistic, stage craft, partly by his racy humor and power of direct, vivid, and convincing presentation. He wrote unassisted: *A New Wonder* (1632); *All's Lost by Lust* (1633); *A Match at Midnight* (1633); *A Shoemaker a Gentleman* (1638). A list of the plays on which he collaborated with various of his distinguished contemporaries is conveniently accessible in the *Dictionary of National Biography,* vol. xlix, p. 363.

ROWLEY POEMS. See Chatterton, T.

ROWLEY REGIS, rō'lī rē'jīs. A town in Staffordshire, England, in the extreme southern part, 5 miles west of Birmingham. It has extensive coal-mining and iron industries. Pop., 1901, 34,670; 1911, 37,006.

ROWNTREE, roun'trē, B. Seebohm (1871–). An English manufacturer and sociologist, son of Joseph Rowntree. Born in York he studied at the Friends' School there and at Owens College, Manchester. He became a director in Rowntree & Co., of which firm his father was chairman, and like his father was prominent in social work and in politics as a member of the Liberal party. He wrote: *Poverty: A Study of Town Life* (1901); *Land and Labour: Lessons from Belgium* (1910); *Unemployment: A Social Study* (1911), with B. Lasker; *How the Labourer Lives* (1913), with M. Kendall; *The Way to Industrial Peace* (1914); *Lectures on Housing* (1914), Warburton Lectures, with A. C. Pigou.

ROWNTREE, Joseph (1836–). An English manufacturer and social worker, father of B. S. Rowntree. He belonged to a Quaker family which became wealthy in the manufacture of cocoa. Much interested in temperance, he wrote: *The Temperance Problem and Social Reform* (7th ed., 1900); *Public Control of the*

Liquor Traffic (1903); *The Taxation of the Liquor Trade* (1909)—all with Arthur Sherwell.

ROWSON, rou'sŭn, SUSANNA (HASWELL) (1762–1824). An Anglo-American dramatist, novelist, and actress. Her novel *Victoria* (1786) brought her father a pension. Her husband became bankrupt and in 1792 she sought support from the stage, coming in the next year to America, where she acted until 1795, appearing mainly in her own plays, *The Volunteers*, a farce (1793), *Americans in England* (1797), and others. Leaving the stage, she opened in Boston a school for girls which she conducted with success until 1822. She also edited the *Boston Weekly Magazine*. Of her novels the most popular was *Charlotte Temple, a Tale of Truth* (1790). In three years 20,000 copies of this book were sold; a sequel, *Lucy Temple*, appeared posthumously (1828). Mrs. Rowson was author of several other novels also. Consult her *Life* by *Elias Nason* (Albany, 1870).

ROW'TON, MONTAGUE WILLIAM LOWRY-CORRY, first BARON (1838–1903). An English politician and philanthropist, born in London. He graduated at Trinity College, Cambridge, in 1860, and three years later was called to the bar at Lincoln's Inn. In 1866 he became private secretary to Disraeli and remained in that capacity and in the most intimate relationship with his chief until the latter's death in 1881. On the recommendation of Disraeli he was made Baron Rowton in 1880. In 1889 he accepted the trusteeship of the Guinness Trust Fund of £250,000 for the improvement of dwellings for artisans. Becoming familiar with working-class conditions in London, Rowton gave £30,000 to establish a poor man's hotel at Vauxhall in 1892. Five other of these Rowton houses were subsequently built, the last in 1905, and the idea was also adopted in other countries.

ROWTON HEATH, BATTLE OF. A battle in the Civil War in England, fought Sept. 24, 1645. Though the royal cause was actually lost at Naseby, Charles attempted to collect a new force in Wales. At the head of 5000 troops the King entered Chester. Colonel Poyntz and Brereton made a combined attack on the King's rear guard, at Rowton Heath, near Chester. The King lost about 1300 men.

ROXA'NA (Lat., from Gk. Ῥωξάνη) (?–311 B.C.). A wife of Alexander the Great (q.v.). She was a daughter of the Bactrian Prince Oxyartes. Soon after Alexander's death (323), and before the birth of her son, Alexander Ægus, she induced Statira, one of Alexander's wives, to come to Babylon, and there caused her to be murdered. Her son was recognized as first of the heirs of the King, but both he and Roxana were put to death by Cassander's orders. (Plutarch, *Alexander;* Arrian, *Anabasis*, vii, 27; Diodorus, books xviii and xix.)

ROXBURGH, rŏks'bŭr-ŭ. A border county of southeast Scotland (Map: Scotland, F 4). Area, 665 square miles. The physical aspect is varied and picturesque, with the Cheviot and Lauriston Hills bounding a considerable portion of its borders. The interior is generally fertile and is farmed to the greatest advantage. The chief river is the Tweed. Chief towns, Jedburgh, the capital, and Hawick. Pop., 1901, 48,800; 1911, 47,192.

ROXBURGHE, JOHN KER, third DUKE OF (1740–1804). An English bibliophile, born in London. He was appointed by George III a lord of the bedchamber in 1767 and groom of the stole and privy councilor in 1796. He collected one of the most remarkable private libraries ever amassed in Great Britain. His more important acquisitions included a collection of works printed by Caxton.

ROXBURGHE CLUB. A famous English book club, the first of these associations devoted to the reprinting for their members of old and rare books. It was founded in London after the sale of the magnificent collection of books formed by John, third Duke of Roxburghe, which realized nearly £25,000. The sale of the Valdarfer Boccaccio for £2260 was celebrated by a dinner at the St. Albans Tavern, at which the club was founded, to consist of 24 members, each of whom was made responsible for the reprinting of one book. See BOOK CLUB.

ROX'BURY. Formerly a city in Suffolk Co., Mass., but since 1868 a part of Boston (q.v.) (Map: Boston and vicinity). Roxbury was settled in 1630, and included among its early inhabitants Thomas Dudley (q.v), thrice Governor of Massachusetts, and John Eliot (q.v.), who was minister here for nearly sixty years (1632–90). The latter is buried here. Theodore Parker (q.v.) was the pastor of the Unitarian Church of West Roxbury (1837–45). The famous Roxbury Latin School was established as the "Free School in Roxburie" some time between 1642 and 1645, and was endowed by Thomas Bell in 1671. The Brook Farm (q.v.) experiment was attempted at West Roxbury. General Joseph Warren (q.v.) and William Eustis (q.v.) also resided here. Consult Drake, *The Town of Roxbury* (Roxbury, 1878; new ed., 1905).

ROX'OLA'NI. A warlike people of Sarmatian origin, who dwelt north of the Mæotis Palus, between the Tanaïs (Don) and Borysthenes (Dnieper). They appear as early as the time of Mithridates the Great and about 69 A.D. had reached the boundary of Mœsia. Their inroads into the Danubian provinces induced the Emperor Hadrian to come to terms with them by paying an annual tribute. Later, however, they were Roman auxiliaries. Mention is made of them last in the eleventh century.

ROY, JOSEPH EDMOND (1858–1913). A Canadian author, born at Lévis, Quebec, and educated at Laval University. He practiced as a notary public at Lévis for many years, becoming president of the Provincial Chamber of Notaries in 1909; but his chief activity was in Canadian historical and geographical research. In 1908 he joined the staff of the Dominion Archives Bureau, Ottawa. With his brother he founded the *Bulletin des Recherches Historiques* in 1895. He contributed to the *Catholic Encyclopedia* and other works and periodicals. Among his publications are: *L'Ordre de Malta en Amérique* (1888); *Au royaume du Saguenay* (1889); *Histoire de la seigneurie de Lauzon* (5 vols., 1897); *L'Ancien barreau au Canada* (1897); *Jean Bourdon et la baie Hudson* (1897); *Principes de gouvernment chez les Indiens du Canada* (1901). His brother, Pierre Georges Roy, wrote several books on French-Canadian families.

ROY, WILLIAM (1726–90). A British military engineer and geodesist. He was born in Carluke Parish, Lanarkshire, and at the age of 20 became connected with the army. He was the first British geodesist. He was employed in preparing for the government a map of the Highlands and finally of the whole mainland of Scotland, which, however, owing to imperfect instru-

ments and the hurried nature of the survey, was only, to use Roy's own words, "a magnificent military sketch." After a military career in which his engineering skill was frequently availed of, Roy devoted himself to scientific pursuits, and in 1783 was employed by the British government to connect the geodetic surveys of France and England in order to determine the relative positions of the Paris and Greenwich observatories.

ROYAL, roi'al, Joseph (1837–1902). A Canadian journalist and politician. He was born at Repentigny, Quebec, and was educated at St. Mary's Jesuit College, Montreal. He early began newspaper work, founded *Le Nouveau Monde* (1857), *L'Ordre* (1859), and was one of the founders of *La Revue Canada* in 1864. Although called to the bar in 1864, he continued in journalism. He removed to Manitoba in 1870 and established *Le Métis*, which in 1882 became *Le Manitoba*. He practiced, however, at the Manitoba bar, and in 1870–79 was a Conservative member of the Manitoba Legislature, being elected in the latter year to the Dominion House of Commons. In 1888–93 he was Lieutenant Governor of the Northwest Territories. In 1894 he became editor of *La Minerve*, Quebec. He published *Histoire du Canada, 1841 à 1867* (1909). Consult Alexander Begg, *History of the North-West* (Toronto, 1894).

ROYAL ACADEMY OF ARTS, The. The principal British art organization, the purpose of which is to improve and cultivate painting, sculpture, and architecture in Great Britain. It dates from 1768 and was founded by George III in response to a memorial presented by William Chalmers, architect, and Benjamin West, painter. Sir Joshua Reynolds was its first president. The number of academicians usually is about 40, and the number of associates is a little less. The president is knighted upon election, and the presidency is for life. Among the painters who besides Reynolds have filled this office are Benjamin West, Lawrence, Eastlake, Leighton, Millais, and Poynter (1896 et seq.). The first permanent rooms of the Academy were in the royal palace, Somerset House (1771). The society removed to the National Gallery, Trafalgar Square, in 1837, and finally in 1869 to Burlington House. The present buildings were built out of the savings of the Academy at the cost of over £160,000. Over 2000 works of art are brought together at the Academy exhibitions, which take place each spring, and no artist may exhibit more than eight works. There are also other exhibitions, besides those of the Academy proper, which take place under its patronage. The permanent collection of the Academy contains many valuable paintings, as well as the diploma works of nearly all the academicians. The art schools of the Royal Academy, also in Burlington House, are free to all students in painting, sculpture, and architecture. The Academy also administers a number of important trust funds, providing for several traveling scholarships, and various medals and prizes. Consult: Sandby, *History of the Royal Academy of Arts from its Foundation in 1768* (London, 1862); Laidlay, *The Royal Academy: Its Uses and Abuses* (ib., 1898); Algernon Graves, *Royal Academy of Arts: Dictionary of Contributors and their Work from 1769 to 1904* (ib., 8 vols., 1905–07); *The Year's Art* (ib., annually).

ROYAL ANTELOPE. One of the diminutive steinboks of the genus *Nanotragus*, remarkable as the smallest of all the ruminants, standing only 12 inches high at the shoulder. It is chestnut in color on the upper part and pure white below. It is a native of the Guinea coast. Consult the *Proceedings* of the Zoölogical Society of London, for 1872.

ROYAL ARCA'NUM. One of the leading fraternal, mutual assessment, beneficiary secret societies in the United States. It was formed at Boston and incorporated in Massachusetts in 1877. Headquarters are at Boston, where the Royal Arcanum owns a building in which meetings of the Supreme Council or governing body are held. Subordinate councils, of which there are nearly 2000 scattered throughout the United States, are grouped under and governed directly by State or grand councils, the latter sending representatives to make up the supreme body. The membership of the order in 1915 was about 245,000. Only men are eligible to membership. The Royal Arcanum has several times found its rates of assessment too low to insure solvency and permanence. On each occasion, however, it has risen to the emergency and readjusted its plan of assessments, and is now said by actuaries and other experts to be charging enough for the life insurance which it contracts to pay to beneficiaries of members to justify fully the promise of success. Total benefits, insurance and other, paid to members and beneficiaries from its organization in June, 1877, to Sept., 1915, aggregate $176,123,000.

ROYAL ARCH MASONS. See Masons, Free.

ROYAL ASSENT. See Assent, Royal.

ROYAL ECONOMIC SOCIETY. An association founded in London in 1890, known as the British Economic Association until 1902, when it was incorporated under its present name. The society publishes a quarterly journal known as the *Economic Journal*, of which Prof. F. T. Edgeworth, D.C.L., and Mr. Henry Higgs are editors. Mr. Goschen was its president from its founding until his death in 1907; since that year the presidency has been held by Mr. Haldane, and it numbers among its vice presidents Mr. Bryce, Mr. John Morley, Mr. Balfour, and others well known in public life. The *Economic Journal* is the foremost economic publication in scientific value in the British Empire and represents all shades of economic opinion. The association holds no regular scientific meetings, but gives an annual dinner in London.

ROYAL FERN. See Osmunda.

ROYAL FISH. See Fish, Royal.

ROYAL GEOGRAPHICAL SOCIETY. An association founded in London, in 1830, and chartered in 1859 for the advancement and diffusion of geographical science for the encouragement of exploration. It began with the association of the members of the Raleigh Dining Club, an organization of travelers, who wished to establish a society to aid scientific research in geography. In the first year of its existence 460 fellows, including the King, the Duke of Wellington, and many other prominent persons, were enrolled. Its membership in 1916 was about 5000. The society began in 1832 to publish annual reports of its investigations, together with its proceedings, in the *Royal Geographical Journal*, but in 1882 this was succeeded by a monthly magazine, entitled *The Proceedings of the Royal Geographical Society, and Monthly Record*. This in turn was changed in 1893 to the *Geographical Journal*. The society also issues a *Year Book*,

and booklets of information for travelers. Considerable sums of money are spent each year in research and exploration, and contributions are also made for the maintenance of the School of Geography in Oxford and Cambridge. The library contains 50,000 volumes and many original charts and maps. The society awards a medal for exploration.

ROYAL HISTORICAL SOCIETY. A learned association in London, founded in 1868 and incorporated in 1899, with the object of promoting historical study. Its membership, which is international, was 547 in 1914, divided into fellows, honorary fellows, and corresponding members. In 1897 the Camden Society (q.v.) was amalgamated with the Royal Historical Society and the Camden publications were transferred to the latter. The Royal Society publishes annual volumes of *Transactions* and *Documents*.

ROYAL HOUSEHOLD. See HOUSEHOLD, ROYAL.

ROYAL HUMANE SOCIETY. See HUMANE SOCIETY, ROYAL.

ROYAL INSTITUTION OF GREAT BRITAIN. An organization founded in London in 1799 and chartered in the following year as the Royal Institution for the Promotion, Diffusion, and Extension of Science and Useful Knowledge. Its principal objects are to further scientific and literary research, to spread the principles of inductive and experimental science, and to promote the application of such principles to the arts. The idea of such an institution originated with Benjamin Thompson, Count Rumford (q.v.), who was supported in the execution of his plans by Sir Joseph Banks, president of the Royal Society. It was Count Rumford's desire to extend a knowledge of the principles of physics and mechanics among the lower classes by means of public lectures and demonstrations, with a view of ameliorating the material condition of the people. Almost from the beginning the institution assumed a leading place in the scientific world, although it was soon found necessary to depart from Count Rumford's idea of making the work of the society deal exclusively with the welfare of the lower classes. Its continued prosperity has been due chiefly to a succession of brilliant lecturers and experimenters, beginning with Thomas Young, who was professor at the institution from 1801 to 1803, and including such great names as Sir Humphry Davy, Michael Faraday, John Tyndall, Sir Edward William Robert Grove, Sir Edward Frankland, William Odling, John Hall Gladstone, Edwin Ray Lankester, Sir James Dewar, and Lord Rayleigh. Within its laboratories have been made some of the most notable discoveries in physical and chemical science, and especially under Faraday and Tyndall valuable work was done in the popularization of these sciences. A feature of the work of the institution is its evening lectures, at which the most eminent scientists are invited to present the latest achievements within their fields to the public. The institution has been the recipient of many benefactions, the most noted of which is the bequest of £10,000 by John Fuller, M.P., in 1831, for the establishment of a Fullerian professorship in chemistry and physics. Young men of special aptitude are offered facilities for carrying on research work and in case of need are given pecuniary assistance. The library of the institution contains 60,000 volumes.

ROYAL IRISH ACADEMY. See IRISH ACADEMY, ROYAL.

ROY'ALL, ISAAC (c.1720–81). An American colonist, born probably in Antigua, British West Indies, where his father had large plantations. He early settled in Medford, Mass. From 1752 until 1774 he was an executive councilor of the province, and in 1761, for his services in the French War, was commissioned brigadier general, the first American to attain that rank. During the agitation which preceded the Revolution he remained loyal to the King and went into voluntary exile. After remaining for some time in Halifax he went to England, where he died of smallpox. Though his estates had been confiscated, he left an endowment for the law professorship at Harvard which still bears his name.

ROYAL MILITARY ACADEMY. See MILITARY EDUCATION.

ROYAL MILITARY ASYLUM. See DUKE OF YORK'S SCHOOL.

ROYAL NAVAL COLLEGE. A professional school of the British navy located at Greenwich (q.v.) and formally opened in 1873. It trains midshipmen and higher officers and affords technical instruction in the theoretical and scientific studies. See NAVAL SCHOOLS OF INSTRUCTION.

ROYAL OAK. An oak tree which stood near the farm of Boscobel in Shropshire and which for 24 hours afforded concealment to Charles II after the battle of Worcester in 1651. The tree was destroyed after the Restoration by relic hunters, but an oak grown from an acorn of the original tree stands on the spot, and there is another, said to have been planted by the King, in Hyde Park.

ROYAL OBSERVATORY. See GREENWICH OBSERVATORY.

ROYAL PURVEYANCE. See PURVEYANCE, ROYAL.

ROYAL SOCIETY, THE. A society organized in London in 1660 as The President, Council, and Fellows of the Royal Society of London for Improving Natural Knowledge. It is the oldest scientific society in Great Britain and one of the oldest in Europe. The preliminary meetings were held on the suggestion of Theodore Haak, a German resident of London, principally at Gresham College, where, on Nov. 28, 1660, the first journal of the society was opened by the originators. Gresham College became the permanent headquarters, and on March 6, 1661, Sir Robert Moray was elected president, which position he held until the incorporation of the society, July 15, 1662. The charter was amended in 1663, and on May 13 of that year the council of the Royal Society met for the first time.

From the outset the society maintained correspondence with men of philosophical attainments on the Continent, from which sprang the *Philosophical Transactions*, the first number of which appeared in March, 1665. By 1750 there had been 496 numbers issued, and it was decided that thereafter the work be published annually in volumes, under the superintendence of a committee of the council. In 1666, on invitation of Henry Howard of Arundel, the home of the society was changed to Arundel House. Howard also presented the council with the library of his grandfather, Thomas, Earl of Arundel, which was the foundation of the fine library of over 45,000 volumes now possessed

by the society. In 1710 the society moved from Arundel House to Crane Court, where it remained until 1780, when the government assigned it apartments in Somerset House. The present home of the society is Burlington House.

The Royal Society, among other duties, has the administration of the annual government grant of £2000 to be divided among a limited number of persons as compensation for outlay incurred by them in scientific research during the year. Four medals are awarded every year, viz., one Copley, two Royal, and a Davy. The Copley medal was founded on a bequest from Sir Godfrey Copley in 1709 and is awarded to the living author of such philosophical research, either published or communicated to the society, as may appear to the council to be deserving of that honor. The Royal medals were established by George IV and are awarded annually for the two most important contributions to science published in the British Dominions not more than 10 years nor less than one year from making the award. The Davy medal was founded by Dr. John Davy, brother of Sir Humphry Davy, and is bestowed annually for the most important discovery in chemistry in Europe or British America. Foreigners of scientific eminence, to the number of 50, may be chosen to membership. The session of the society lasts from November to June, ordinary meetings being held weekly. Papers are read at various times and during the year are published in either the *Philosophical Transactions* or the *Proceedings* of the society. It has also published the *Catalogue of Scientific Papers, 1800–1900* (14 vols., 1867–1902), with a *Subject Index* to be complete in 17 volumes (vols. i–iii, 1908–14), and the *International Catalogue of Scientific Literature* (1900 et seq.). Consult *Record of the Royal Society* (3d ed., Oxford, 1912) and *Celebration of the 250th Anniversary of the Royal Society of London* (ib., 1913).

ROYAL SUPREMACY. See SUPREMACY, ROYAL.

ROYAL UNIVERSITY OF IRELAND. An examining and degree-conferring institution, established by the University Education Act of 1879 and formally organized in 1880. Its constituent members were the Queen's Colleges at Belfast, Cork, and Galway. The university was superseded in 1909 by the establishment of Belfast University and the National University of Ireland (q.v.).

ROYAN, rwä'yäN'. A seaside resort in the Department of Charente-Inférieure, France, at the mouth of the Gironde, 22 miles southwest of Rochefort (Map: France, S., C 3). It is a well-built town with a handsome municipal casino. Royan dates from a priory in which the Abbé de Brantôme wrote part of his memoirs. As a Huguenot stronghold it was besieged by Louis XIII in 1622. The town is one of the chief seaside resorts in France, attracting about 350,000 visitors annually. Permanent pop., 1901, 8374; 1911, 9330.

ROYCE, JOSIAH (1855–1916). An American philosopher, born at Grass Valley, Nevada Co., Cal. He graduated at the University of California (Berkeley) in 1875, studied also at Leipzig, Göttingen, and Johns Hopkins (Ph.D., 1878) and in 1878 was appointed instructor in English in the University of California. At Harvard he rose from instructor in philosophy (1882) to be professor of that subject after 1892. His earlier writings, not in philosophy, include: *A Primer of Logical Analysis, for the Use of Composition Students* (1881); *California from the Conquest in 1846 to the Second Vigilance Committee in San Francisco* (1886); *The Feud of Oakfield Creek* (1887), a novel. The works for which Professor Royce is known, however, are: *The Religious Aspect of Philosophy* (1885); *The Spirit of Modern Philosophy* (1892); *The Conception of God* (1897), jointly; *Studies of Good and Evil* (1898); *The Conception of Immortality* (1900); *The World and the Individual* (2 vols., 1900–01), Gifford lectures at Aberdeen; *Psychology* (1903); *Herbert Spencer* (1904); *Philosophy of Loyalty* (1908); *Race Questions, Provincialism, and other American Problems* (1908); *Wm. James and Other Essays on the Philosophy of Life* (1911); *Sources of Religious Insight* (1912); *Problem of Christianity* (1913); *War and Insurance* (1914). In metaphysics Royce became one of the foremost exponents of absolute idealism (see IDEALISM), developing this type of philosophy in such a way that emphasis is laid on individuality, both finite and infinite, and on will rather than on intellect. Royce served as president of the American Philosophical Association and of the American Psychological Association (1901) and became a member of the National Academy of Sciences and of the National Institute of Arts and Letters and a fellow of the American Academy of Arts and Sciences. Honorary degrees came to him from Johns Hopkins, Yale, and Harvard and from Aberdeen, St. Andrews, and Oxford.

ROYE, rwà'y'. A city in the Department of Somme, France, on the Avre River, 26 miles east-southeast of Amiens (Map: France, N., H 3). It has a church dating from the twelfth and sixteenth centuries. It has a considerable corn trade and manufactories of sugar, oil, jewelry, and copper products. Pop., 1901, 4349; 1911, 4515. In the Great War which began in 1914 Roye was captured by the Germans and was the centre of very severe fighting in September, 1914. See WAR IN EUROPE.

ROYER-COLLARD, rwä'yâ'-kŏ'lär', PIERRE PAUL (1763–1845). A French statesman and philosopher, born at Sompuis (Marne). He practiced law and held various offices after the outbreak of the Revolution. Being proscribed for his moderate views during the Reign of Terror, he returned to his old home at Sompuis and lived as a farmer, in order to evade the suspicions of the Jacobins. In 1797 he was elected to the Council of the Five Hundred, but after the 18th Fructidor he retired from politics. In 1809 he accepted the chair of philosophy in the newly created University of France and soon came to exercise an immense influence on philosophic thought in France. He rejected the sensualist system of Condillac and adopted an eclectic philosophy, giving special prominence to the principles of the Scottish school of Reid and Stewart. In August, 1815, he was appointed president of the Commission of Public Instruction, which office he held, with the title of Councilor of State, till July, 1820. In 1817 Royer-Collard for the first time withdrew his support from the government, and in 1819 the rupture was complete. In spite of his royalist leadings he founded the political party of the Doctrinaires in 1820 (see DOCTRINAIRE) and advocated a constitutional monarchy. The French Academy elected him to membership in 1827, and in 1828 he was named

president of the Chamber of Deputies. In that capacity Royer-Collard had to present the famous address of the 221 Deputies (March, 1830), refusing their support to the government, which the King declined to hear read. On the next day the Chamber was prorogued. After the Revolution of July, 1830, he reëntered politics, but in 1842 he withdrew completely from public life. Consult: A. Philippe, *Royer-Collard: sa vie publique, sa vie privée, sa famille* (Paris, 1857); Baron de Barante, *La vie politique de M. Royer-Collard, ses discours, et ses écrits* (2 vols., ib., 1861); Eugène Spuller, *Royer-Collard* (ib., 1895).

ROYERSFORD, roi'ẽrz-fẽrd. A borough in Montgomery Co., Pa., 32 miles northwest of Philadelphia, on the Schuylkill River and on the Pennsylvania and the Philadelphia and Reading railroads (Map: Pennsylvania, K 7). It has extensive stove and brass foundries, glass and bottle works, embroidery and silk mills, a dye and bleaching plant, bridge works, and manufactories of bricks, gas meters, stockings, shirts, shafting parts, wagons, agricultural implements, etc. Pop., 1900, 2607; 1910, 3073.

ROYLE, John Forbes (1799–1858). An English naturalist, born at Cawnpore, India. He studied at the Military Institute of the East India Company, Addiscombe, was appointed assistant surgeon to the company, and served on the medical staff of the army of Bengal. In 1823 he was appointed physician at the station of Saharunpore and superintendent of the garden there. He showed that the drugs sold in the Indian bazars were identical with the medicines given by Greek physicians. He was appointed professor of materia medica at King's College, London, in 1837. Among his works are: *An Essay on the Antiquity of Hindoo Medicine* (1837); *Essay on the Productive Resources of India* (1840); *On the Culture and Commerce of Cotton in India and Elsewhere* (1851); *The Arts and Manufactures of India* (1852); *The Fibrous Plants of India Fitted for Cordage* (1855). Consult Britten and Boulger, *Biographical Index of British and Irish Botanists* (London, 1893).

ROY'TON. A town in Lancashire, England, 2 miles north-northwest of Oldham. It has large cotton industries. The town has undergone much modern improvement, maintains gas and water supplies, and owns markets. Pop., 1901, 14,880; 1911, 17,069.

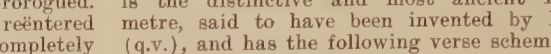
ROZHDESTVENSKY, rŏzh'dĕst-vĕn'skĭ, Zinivy Petrovitch (1848–1909). A Russian naval officer. He fought as a lieutenant in the Russo-Turkish War, rose to be admiral, and in 1904 was placed in command of the Baltic fleet dispatched to the Far East. (See Russo-Japanese War.) He was defeated by Admiral Togo in the battle of the Sea of Japan in May, 1905, and was wounded and taken prisoner. On his return to Russia he was tried by court-martial and acquitted of blame in July, 1906.

RUABON, rōō-ă'bŏn. A parish town and railway junction of Denbighshire, Wales, on the Dee, 5 miles southwest of Wrexham (Map: Wales, D 3). Iron ore and anthracite coal are mined extensively in the neighborhood, and there are important ironworks and brick and tile factories. Pop. (parish), 1901, 21,721; 1911, 24,375.

RUAD, rōō-ăd'. See Arvad.

RUATÁN, rōō'ä-tän', or **ROATÁN,** rō'ä-tän'. An island off the northern coast of Honduras (Map: Central America, D 2).

RUBAIYAT, rōō-bī-yät' (Ar. pl. of *rubā'ī*, quatrain). The term applied to a collection of Persian quatrains. The *rubā'ī*, or quatrain, is the distinctive and most ancient Persian metre, said to have been invented by Rūdagī (q.v.), and has the following verse scheme, read from right to left:



with the rhyme *aaaa* or *aaba*. The rhyme may, however, go back several syllables, or even several words, as in the following example cited from the forty-fifth quatrain of Payne's translation of Omar Khayyam:

Skinker, since ruin is of Fortune planned for thee and me,
This nether world is no abiding land for thee and me;
Yet, so the wine-cup in the midst but stand for thee and me,
Rest thou assured the very Truth's in hand for thee and me.

There are many variations in rhyme which may become as intricate as quatrain 770 of the same translation:

I spake, thou spakest: heart gave I thee, thou me disdain.
I take, thou takest: thou heart from me, I from thee pain.
I am, thou art, too—thou merry and I for thee sad.
I make, thou makest: thou wrong and I patience in vain.

Nearly all the poets of Persia include in their works a Rubaiyat. Through the translation of Omar Khayyam (q.v.) by Edward FitzGerald (q.v.) this quatrain, modified to the English heroic metre of the iambic pentameter, was made an English verse form. Consult: Blochmann, *The Prosody of the Persians* (Calcutta, 1872), which contains 24 *rubā'ī* metres; James Darmesteter, *Origines de la poésie persane* (Paris, 1887); John Payne, *Quatrains of Omar Khayyam of Nishapour* (London, 1898); J. R. Tutin (comp.), *A Concordance to FitzGerald's Translation of the Rubáiyát of Omar Khayyám* (ib., 1900); E. G. Browne, *Literary History of Persia* (2 vols., ib., 1906–09).

RUBASSE, rụ'bäs' (Fr., red-colored quartz), Ancona Ruby, or Mont Blanc Ruby. A variety of crystallized quartz containing occluded spangles of hematite or specular iron, which reflect a bright-red color resembling that of the ruby.

RUBATO, rōō-bä'tô, Tempo (It., stolen). In music, a term indicating that the performer is to modify the regular rhythmic movement by emphasizing, and thus prolonging, important notes. The less important notes of the bar must consequently be curtailed so that its aggregate value may remain unchanged.

RUBBER (from *rub;* perhaps connected with Gael. *rub*, Welsh *rhubio*, to rub, Ir. *ruboir*, Gael. *rubair*, a rubber), India Rubber, or Caoutchouc. A substance much used in the arts on account of its peculiar and special properties. Chemically rubber is a hydrocarbon with the approximate formula $C_{10}H_{16}$ and is extremely resistant, being soluble only in carbon disulphide, carbon tetrachloride, and in volatile oils such as turpentine, ether, gasoline, and the like. Rubber is not the product of a single species of trees, but is obtained commercially from the stems of trees of *Hevea* (q.v.), *Manihot*, *Ficus*, *Castilloa*, and *Funtumia*, and from the climbers *Landolphia* and *Parameria*, from the roots of *Clitandra* and *Carpondinus*, from the stems and leaves of *Palaquium*, and from the whole guayule plant

Parthenium. Rubber-producing plants thrive in tropical climates only, but under widely varying conditions. Some of them require a moist alluvial soil, and others flourish in a stony soil with only an intermittent rainfall. Rubber occurs in a solid state as a deposit in the woody fibre of the shrub *Parthenium argentatum* in Mexico and Texas, from which the guayule rubber of commerce is derived. Rapidly as the consumption of rubber has increased, there seems no danger of exhausting the world's supply, so abundant and widely scattered are its sources; for, notwithstanding the exhaustion of certain forests by unscientific harvesting of the trees, there are extensive plantations of cultivated rubber, especially in Malaya, from which increasing supplies annually are derived. In 1900 plantation rubber did not figure at all in the world's markets, the exports from Ceylon and Malaya amounting in 1903 to but 41,684 and 1000 pounds respectively, yet by 1910 the annual production was 8000 tons, in 1912, 25,000 to 30,000 tons, and in 1915 it was approximately 93,000 tons. Likewise the rubber acreage in British Malaya, which in 1906 was 99,230, in 1914 had amounted to 708,545 acres, 32,500 acres being planted in that year. Tapping of trees in Malaya begins when a girth of 18 inches is attained 3 feet from the base, which usually takes place in about three and a half years. In Sumatra and elsewhere in the East the rubber acreage had correspondingly increased. These plantations furnished employment for considerable capital, mostly British, and at one time speculation in the shares of rubber companies in London reached an extraordinary state. The Amazon districts of the State of Pará in Brazil from their wild trees furnished for many years the largest quantity and best quality of rubber, the standard by which all other varieties are compared, while other grades were and are furnished by the Atlantic states of Brazil and by Bolivia and Peru, such as the Caucho of the latter country. But lately plantation rubber from the Far East is making serious inroads into the South American product.

Imports of rubber into the United States have greatly increased in recent years, owing largely to its use for automobile tires and also in other manufacturing industries. The quantity imported was, in 1904, 59,016,000 pounds, and, in 1915, 172,068,428 pounds, of which over one-half was plantation rubber from the Orient, the remainder chiefly from Brazil. The import price of the plantation rubber averaged nearly 50 per cent higher than that from Brazil.

In addition chemists for years have been working on synthetic rubber to take the place of the natural product, and, while this is possible on a theoretical and laboratory basis, the artificial article has not entered extensively into trade and industry, although one of 1000 sets of motor tires made at the Baeyer Farbenfabrik at Elberfeld, Germany, has run over 10,000 miles. See SYNTHETIC RUBBER.

The first record of India rubber was made in accounts of Columbus' second voyage to America, where it is related that he found the inhabitants of Hispaniola (Haiti) amusing themselves with rubber balls. In a book published in Madrid in 1615 Juan de Torquemada mentions the tree which yields rubber in Mexico, describes the mode of collecting the gum, and states that it is made into shoes; also that the Spaniards used it for waxing their canvas cloaks to make them resist water. It was first studied scientifically by the French geodesist La Condamine while in Ecuador, and samples of the product with a note were presented to the French Academy in 1736. First known as elastic gum, the name of India rubber was suggested by Priestley, the chemist, about 1770 from its use for rubbing out lead-pencil marks. It is stated that the first rubber was brought into the United States in 1800, the very year in which was born Charles Goodyear (q.v.), a man whose inventions made possible the modern rubber industry.

Crude rubber is obtained from the milky juice of the rubber tree, of which there are numerous varieties. The *Hevea brasiliensis* furnishes the Pará rubber of commerce, is found wild in the Amazon valley of Brazil, and is now largely cultivated on the Eastern plantations. The Ceará or Manicoba rubber of commerce is produced from the *Manihot glaziovii*, also coming from Brazil. It also is planted somewhat in Africa and other tropical regions. From tropical Africa comes rubber produced from various creepers of the genera *Landolphia* and *Clitandra*, which give many of the African rubbers of commerce, such as Congo, Madagascar, etc.

The milky juice or latex of the rubber is not the true sap, but a secretion which does not seem to be essential to the life of the plant. In this juice float minute globules of rubber, which, when the juice is allowed to stand, rise to the top, like cream. Various methods are employed for collecting the juice in different regions, the future character of the rubber depending much upon how this is done and how the separation of the caoutchouc from the aqueous liquid is effected. The annual yield from a single tree is from 2 or 3 to 16 or 17 pounds. The rubber is sometimes collected by simply cutting the trees or vines down, but this wasteful method has been in most cases abandoned, and it is customary to make incisions in the trunk through which the milk oozes out. The trees are tapped at sunrise, as the milk is supposed to flow more freely during the morning hours. The first row of incisions is often made in a circle surrounding the tree about 6 feet from the ground, the next morning a row lower down is made, and so on, each succeeding morning, until the ground is reached. In each incision a little clay cup, molded by the workman and holding about a gill, is placed, and its contents emptied daily into a larger vessel, in which it is allowed to simmer over a slow fire until the water is evaporated and the rubber shaped into cakes is ready for export. This is the almost universal method of collecting Pará rubber in the native forests of Brazil and Bolivia.

Contrary to general impression, the collection of India rubber from the forests and plantations is not generally a wasteful process resulting in the destruction of the trees. Even where trees or vines are cut down they are replanted in all progressive rubber regions. To obtain the latex trees are destroyed in Central America, and also in Africa where trees and vines are cut down, but many new ones are planted, and the forest and plantations are now generally under the direction of expert botanists and rubber culturists.

The method of collection employed on planta-

tions is usually the so-called "herring-bone" system, where a series of oblique cuts running into a central vertical channel are made and at the base a cup is located into which the latex empties. This process is repeated until a part of the bark is removed, and the portion of the tree thus affected is permitted to rest for several years. Recently, on plantations where the rubber milk is collected in large amounts, more scientific means have been adopted for obtaining the caoutchouc by the use of chemicals and machinery, the larger plantations turning out rubber which is washed and rolled into sheets or molded into large blocks. Plantation latex is usually coagulated with acetic acid and then is removed from the serum, passed through washing rolls, and in the form of sheets or crepe hung up to dry. It may also be smoked. The greater part of the rubber of commerce, however, contains dirt and other impurities, so that extensive washing at the mill is required.

The manufacture of rubber did not begin until about 1820, when Nadier invented a process for cutting rubber into thread and manufacturing tissues from it. The application of rubber to the making of waterproof cloth first gave it commercial importance, although it had been previously made into flexible tubes, for the use of surgeons and chemists, and into bottles. Waterproof cloth was first made by Charles Macintosh, a Scottish chemist, who in 1823 reduced the rubber to a solution in naphtha and spread it between two layers of cloth. Waterproof coats still bear his name. In 1852 a Boston sea captain imported into America 500 pairs of rubber boots which had been made by the natives of Brazil. These were readily sold for from $3 to $5 per pair, and a great demand for them was created. In the meantime William Chaffee had developed a rubber varnish for coating different materials to make them waterproof. In 1833 the Roxbury India Rubber Company was formed and flourished. But it was soon found that these waterproofed articles grew hard and cracked in the winter and became sticky in the summer. The demand for them ceased, and their manufacture was given up.

Charles Goodyear (q.v.), an unsuccessful merchant, in the meantime had turned his attention to the manufacture of rubber goods and was striving to find some process which would obviate the defects of pure rubber and render it less susceptible to the influence of heat and cold. He tried mixing it with magnesium, with quicklime and water, and with nitric acid. It had been discovered in 1832 by Luedersdorf, a German chemist, and also by Nathaniel Hayward, of Woburn, Mass., that by mixing dry sulphur with rubber its stickiness was removed. Hayward's patent and process were acquired by Goodyear, who by accident dropped upon a hot stove some of the mixture and found to his astonishment that the high heat did not melt it. He next placed it in extreme cold, and its texture still remained unchanged. Thus, after years of patient experimenting, the art of *vulcanizing* was accidentally discovered. Goodyear immediately developed the process and placed it upon a commercial basis, securing his first United States patent in 1844. Alexander Parkes, an Englishman, about the same time invented the cold vulcanization process, consisting in dipping small articles of rubber into a bath of sulphur chloride dissolved in bisulphide of carbon. The vulcanization is quickly effected by absorption, but is not so thorough as that obtained by the process invented by Goodyear. The last great rubber invention was that of hard rubber by Goodyear.

Vulcanizing consists commonly in mixing sulphur with rubber and then subjecting the mixture to moderate heat (say 300° F.) for six or more hours. Rubber may also be vulcanized by dipping in melted sulphur, by treating with a solution of sulphur monochloride, or exposing to the vapor of sulphur monochloride. The effect of vulcanization is to render rubber elastic, impervious, and unchangeable in texture under all ordinary conditions. Although sulphur is the only essential ingredient, other materials are often added at the same time, as silicate of magnesium, carbonate of lead, asphalt, and tar, each of which imparts a different quality to the product.

Commercial rubber is a tough fibrous substance, possessing elastic properties in the highest degree. Reduced to the temperature of freezing water (32° F.), it hardens and in greater part, if not entirely, loses its elasticity, but does not become brittle. When heated, as by placing in boiling water, it softens and becomes very much more elastic than at ordinary temperatures, though it does not in any degree dissolve in the water. If suddenly stretched to seven or eight times its original length, it becomes warm, and, if kept in this outstretched form for several weeks, it appears to lose in great part its elastic properties and in this condition is readily cut into those thin threads which are used in the *elastic* put in gloves, garters, etc., and the elasticity of which is readily renewed by the application of gentle heat. Elastic thread is now prepared with vulcanized rubber.

There are some useful applications of India rubber in the liquid or semiliquid state which it is worth while to note; thus, when melted at 398° F. and mixed with half its weight of slaked lime, it forms a useful cement, which can be easily loosened, but it will dry and harden if red lead is added. A very tenacious glue is formed by heating rubber, coal tar, and shellac together. It forms an ingredient in some special kinds of varnishes, and it also improves the lubricating qualities of mineral oils when a small quantity is dissolved in them.

Process of Manufacture. The first step in the manufacture of crude rubber is one of thorough cleansing. The rubber is allowed to remain in steam-heated water for about 24 hours, after which it is cut up and the larger impurities removed by hand. It is then washed by passing between two heavy corrugated iron rollers. A stream of water flows over the rubber from a pipe directly at the point of contact with the rollers, and the combined action of the rollers and water removes all foreign substances adhering to the rubber. The rubber is next placed in drying chambers and after thorough drying is stored in a dark dry room until needed.

Methods of vulcanizing vary with the article to be vulcanized, but in general the purified and masticated gum is thoroughly kneaded with the requisite amount of sulphur and cut and shaped before heat is applied. Or the sheets, after they have been hung up to dry for months

it may be, are placed in smooth hot rolls which running together press the rubber so as to make it smooth and entirely homogeneous, the sulphur and other materials being incorporated during this process. The plastic material coming from the rolls is then put through the calenders, where it is made into sheets upon the cloth that is the foundation. In case the goods are to be made of a rubber cloth, as in the case of shoes (q.v.), the rubber is spread on its backing with heated iron rollers and the goods made up before they are vulcanized. The material is not sewed, but held together by some solvent, as turpentine, or a cement of rubber in a benzene solution, which makes the edges adhere. To prevent adhesion of the articles during the vulcanizing process they are very carefully packed, and powdered soapstone, talcum, or other powder is freely used. The rubber is heated in a cast-iron cylindrical oven with one end fitted as a door.

Goodyear invented two different kinds of rubber, the pliable *soft rubber* and *hard rubber*, or ebonite, which is used for making a great variety of utensils and fancy articles. The chief difference between the two is in the amount of sulphur used and heat applied.

A few general classes of vulcanized rubber goods are: (1) footwear and other waterproof clothing; (2) mechanical goods, including hose, belting, tires, etc.; (3) electrical and other scientific appliances; (4) medical and surgical apparatus and allied articles; (5) hard-rubber goods; (6) liquid or semiliquid materials, as varnishes and cements. This classification is obviously imperfect, but it will serve to suggest the enormous variety of commercial products of which India rubber is an essential constituent. The tire industry alone is one of extraordinary dimensions, as solid or pneumatic tires are required for practically all forms of motor cars and motor trucks. In electrical appliances rubber is almost indispensable as an insulating material, even being substituted for gutta-percha in insulating submarine cables.

In 1915 the world's production of rubber was estimated at about 146,000 tons.

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See Hevea: Hose.

RUBBLE. See Ice; Masonry.

RU'BEFA'CIENTS (from Lat. *rubefaciens*, pres. p. of *rubefacere*, to make red, from *rubere*, to be red, from *ruber*, red + *facere*, to make). Substances employed in medicine for the purpose of stimulating and reddening the skin over the part to which they are applied. These agents have the power of relieving congestion, pain, spasm, or excessive irritability of superficial parts or deep-seated organs. All substances which after a certain period act as blisters may be made to act as rubefacients if their time of action is shortened. Among the most commonly used rubefacients may be mentioned: *Heat* in the form of hot baths, cloths soaked in very hot water, poultices, bottles filled with hot water, and heated solids such as bricks, sandbags, etc. *Mustard*, either in the shape of mustard leaves (sheets of paper coated with mustard and applied moist) or thick poultices, composed of various proportions of mustard mixed with flour or meal and cold water. (See Poultice.) *Oil of turpentine*, applied by means of flannels wrung out of hot water and sprinkled with the oil—the turpentine stupe—or as a liniment. *Ammonia* in the form of a liniment (volatile liniment). *Capsicum* (cayenne pepper) in the form of a poultice or alcoholic lotion is much used in the West Indies. *Cantharidin* (Spanish fly) is properly a blistering agent, but may be used as a rubefacient if modified by the free admixture of soap or resin plaster. Plasters of Burgundy pitch and resin cerate are also slightly rubefacient. Rubefacients are used to reduce inflammations or congestions, as in pleurisy and pneumonia; to cause the absorption or removal of inflammatory products as found in chronically enlarged joints; to relieve pain and spasm, as in neuralgia and intestinal cramp. See Counterirritants.

RUBEL'LA. See German Measles.

RUBEL'LITE (from Lat. *rubellus*, reddish, dim. of *ruber*, red). The pale rose-red or pink variety of tourmaline, of which the gem varieties in the United States come chiefly from the famous locality of Mount Mica, near Paris, Me., and from San Diego Co., Cal. Excellent gem varieties of rubellite are also found in Ekaterinburg, in Siberia, and on the island of Elba.

RU'BENS, Peter Paul (1577–1640). The chief master of the Flemish school of painting, one of the most prolific and versatile artists of all times. He was born at Siegen, Westphalia, June 29, 1577, son of Jan Rubens, a lawyer of Antwerp. His father, a Protestant, had been exiled in 1658 to Cologne, where he became a counselor to William the Silent. Imprisoned at Siegan because he had become the lover of Anne of Saxony, the Prince's wife, Jan Rubens was followed by his faithful wife, Marie Pypelincx, who finally secured his release. After her husband's death at Cologne in 1587, the widow returned to Antwerp, where Peter Paul attended school for three years and was a page in the service of Countess Lalaing. He studied under Tobias Verhaegt, a mediocre landscape painter, then for four years under Adam van Noort, who represented the crude, native style, and finally in 1596 under Otto van Veen, a polished representative of the Italian influence. In the meanwhile he was received as master into the guild in 1598. The works of the great Italian colorists attracted him to Venice in May, 1600, and in the same year Duke Vincenzo Gonzaga made him his court painter at Mantua. Sent to Rome in

1601, to make copies of old masters, Rubens also executed there, for Archduke Albert, Governor of the Netherlands, three altarpieces in the church of Santa Croce in Gerusalemme, which are now at Grasse in southern France. In 1603 he went as the Duke's ambassador to King Philip III of Spain, then was active at Mantua and Rome until 1607, when he accompanied the Duke to Genoa. His interest in the architecture at Genoa resulted in the publication, in two parts, of 136 engravings, under the title *Palazzi antichi di Genova* (Antwerp, 1613, 1622). For the church of Sant' Ambrogio at Genoa he painted (at what period it is not known) the "Miracle of St. Ignatius," a work of great splendor. In 1608 we find him once more in Rome, studying the great masters and occupied with several compositions of his own, when news of his mother's illness called him back to Antwerp. He was induced to remain there by Archduke Albert, who appointed him court painter. In 1609 he married Isabella Brant, with whom he appears depicted in the fine portrait of 1610, in the Pinakothek at Munich. A highly finished work of his Roman period is the "St. Jerome," in the Dresden Gallery.

His first great commission came from the city of Antwerp, to paint for the city hall an "Adoration of the Magi" (1610), of large size and glowing color, now in the Madrid Museum. In the same year he completed the famous San Ildefonso altar, now in the Vienna Museum, a work of unsurpassed mastery in the combination of chiaroscuro effect with luminous color, and the "Elevation of the Cross," which, with its far-famed companion piece, "Descent from the Cross" (1612), adorns the Antwerp Cathedral. A modified treatment of the latter subject is in the Hermitage, St. Petersburg, which contains also one of his most successful mythological subjects, dating from between 1612 and 1615, the "Perseus and Andromeda," an equally fine version of which is in the Berlin Museum. To this period belong also the exquisite "Madonna Surrounded by Children," in the Louvre, and the genial group of "Children with a Fruit Garland" (c.1615), in the Pinakothek, Munich. Dated 1614 are a small but precious "Flight into Egypt," in Cassel, and a highly finished "Pietà" in the Vienna Museum, of which there is a larger replica, with landscape by Jan Breughel, in the Antwerp Museum. Breughel also painted the fine garland around the "Madonna with Angels," in the Pinakothek, Munich, which bears the features of Isabella Brant.

From the first, after his settling at Antwerp, pupils had flocked to his studio in such numbers that, as early as 1611, he was obliged to refer applicants to other masters for years in advance. With the constant increase of orders he availed himself of the aid of his pupils and assistants. The design was always by Rubens, who also put on the finishing touches after his assistants had laid in the color. But he also often worked in conjunction with his fellow artists, notably, besides Breughel, with Frans Snyders, who was his collaborator in the spirited "Boar Hunts," in the Dresden and Munich galleries, and in the "Chase of Diana," in the Berlin Museum. Rubens himself was an animal painter of the first rank, witness the "Lion Hunt" (1616), in the Pinakothek at Munich. That gallery also contains several of his most important religious and mythological pictures of this period, to wit: the "Last Judgment" (two treatments, 1616, 1618), "Christ and the Four Sinners" (c.1619), "Nativity" (1620), "Descent of the Holy Ghost" (1620), "The Chaste Susanna," the "Assumption," "Castor and Pollux Abducting the Daughters of Leucippus," "Meleager and Atalanta" (same subject in Cassel), "Drunken Silenus" (1617), and above all "The Battle of the Amazons" (1619), his most famous example of depicting the tumult of battle. Other masterpieces of this period are: "The Conversion of Saul" (c.1617, Berlin Museum); "Scourging of Christ" (1617, St. Paul's, Antwerp); "Expulsion of Hagar" (1618, Hermitage, St. Petersburg); "The Miraculous Draft of Fishes" (1616–18, church of Our Lady, Mechlin), a striking piece of realistic conception; "St. Ignatius Casting Out Devils" (Vienna Museum); "Incredulity of Thomas" (1615), "Christ à la Paille" (c.1617), "Last Communion of St. Francis" (1619), "Christ on the Cross" (known as "Le coup de lance," 1620, a work of remarkable dramatic effect), all in the Antwerp Museum. Among the numerous Madonnas one of the most sympathetic is "Mary, the Refuge of Sinners" (c.1619, Cassel Gallery), which plainly shows the coöperation of Van Dyck. Mythology is represented by "Jupiter and Callisto" (1613) and "Meleager and Atalanta," both in the Cassel Gallery; "Neptune and Amphitrite" (c.1612–14), "Bacchanal" (c.1618–20, with Van Dyck), and "Andromeda" (c.1638), all in the Berlin Museum; "Jupiter and Antiope" and the "Freezing Venus" (both, 1614, Antwerp Museum); "Venus in the Smithy of Vulcan" (Brussels Museum); "Judgment of Paris" (Madrid Museum); "Boreas and Oreithyia" (Vienna Academy); "Bacchanal," "The Daughters of Cecrops," and "Toilet of Venus" (all in the Liechtenstein Gallery, Vienna). Of allegories there are the "Hero Crowned by Victory" (Dresden), replicas in Cassel (1617), Munich, and Vienna; "Tigris and Abundantia" (c.1610, St. Petersburg); "The Four Quarters of the Globe" (Vienna Museum); "The Terrors of War" (1638, Palazzo Pitti, Florence). In 1622 Rubens was called to Paris by Maria de' Medici, to adorn the Luxembourg Palace with the chief episodes from her life. The 24 paintings executed within three years by his pupils from his designs were taken by him to Paris, where they now occupy a separate room in the Louvre; the sketches for 18 are in the Pinakothek at Munich. Another series to represent the history of Henry IV was only partly finished (1628–30). For Louis XIII he completed (1622) 12 cartoons for tapestry, representing the history of Constantine the Great.

Having already undertaken diplomatic missions in 1623–25 for the Infanta Isabella (Regent after the death, in 1621, of Archduke Albert), he was intrusted in 1627 with the negotiations concerning the conclusion of peace between England and Spain. He went to Madrid in 1628 and thence with the King's instructions in 1629 to London, where he brought his mission to a successful ending and was knighted by Charles I in 1630. The same distinction was conferred upon him by Philip IV of Spain. In Madrid, as well as in London, his brush was in great demand, especially for the painting of portraits; in Madrid he also renewed the study of Titian, which strongly influenced the works of his later period. In

PETER PAUL RUBENS

"THE DESCENT FROM THE CROSS,"
FROM THE PAINTING IN NOTRE-DAME CATHEDRAL, ANTWERP

and even grandeur, yet the effect of the whole is not satisfying, because the composer lacked the power of sustaining his inspiration. Perhaps his greatest misfortune was his inability to criticize his own work. Since the beginning of the twentieth century his name has practically disappeared from the concert programmes. Among his best works may be mentioned the *Ocean Symphony*, *Dramatic Symphony*, and a sketch for grand orchestra, *Ivan the Terrible*. Of his operas the following may be singled out: *Die Kinder der Haide* (1861); *Feramors, oder Lalla Roukh* (1863); *Die Makkabäer* (1875); *Der Dämon* (1875); *Nero* (1879). His oratorios include *Paradise Lost* (1858), *The Tower of Babel* (1872), and *Christus* (1888). His concertos for piano and orchestra formerly were great favorites. Rubinstein also composed much chamber music, piano pieces, and songs. He also wrote *Die Musik und ihre Meister* (Leipzig, 1892) and *Gedankenkorb* (1897). He instituted the two Rubinstein prizes of 5000 francs each in playing and composition, open to persons of any nationality, competitions for which are held quinquennially in St. Petersburg, Berlin, Vienna, Paris. Consult: *Erinnerungen aus 50. Jahren, 1839–89* (Leipzig, 1893); M. Bernstein, *Rubinstein* (ib., 1911); La Mara, *Anton Rubinstein* (ib., 1911).

RUBINSTEIN, Nikolai (1835–81). A Russian composer, brother of Anton, born in Moscow. From 1844 to 1846 he was Kullak's pupil in pianoforte and Dehn's in composition, in Berlin. He founded the Moscow Musical Society in 1859. This society opened the Moscow Conservatory in 1864 and appointed Rubinstein director, which position he occupied until his death. Through his activity as a teacher and conductor he exerted a far-reaching influence on the musical life of Russia, especially that of Moscow and St. Petersburg.

RUBI'NUM. See Rovigno.

RU'BLE (Russ. *rublĭ*, perhaps from *rubitĭ*, to cut off, or from Pers., Hind. *rūpiya*, rupee, from *rūpa*, silver). A Russian silver coin of the value of 100 kopecks, the unit of Russian coinage. Since the adoption of the gold standard in 1897 the value of the ruble has been fixed at 51 cents.

RÜBNER, rụp'nēr, Cornelius (1855–). A Danish pianist and composer, born at Copenhagen. He received his musical education there from Hartmann and Gade, and then studied under Reinecke at Leipzig and subsequently under Bülow and Rubinstein. He was conductor of the Symphony Orchestra at Karlsruhe from 1892 to 1904, when he succeeded MacDowell as professor of music at Columbia University. His works include a pantomime, *Prinz Ador;* a symphonic poem, *Friede, Kampf, und Sieg;* a *Festouverture;* a piano trio; brilliant solo pieces for piano; songs.

RU'BRIC (Lat. *rubrica*, red earth, red ochre, red law title, law, rubric, from *ruber*, red). A name applied to the directions for the conduct of divine worship found in various service books, so called because they were originally written, and are now frequently printed, in red ink, to distinguish them from the text of the prayers.

RUBRUQUIS, rụ'brụ'kĕs', or **RUBRUCK,** rụ'brụk', Friar William of (c.1215–c.1270). A traveler, born in Rubruck in French Flanders. Practically all of our information about him comes from his own work, although he is mentioned by Roger Bacon in his *Opus Majus* and in records of the Franciscan Order, to which he belonged. He accompanied St. Louis on his first crusade and remained with him from 1248 to 1252 in Egypt and Syria. He was probably acquainted with Carpini and other travelers in the Far East, from whom he obtained much information. In the winter of 1252–53 he left Louis, went to Constantinople, and started from there, on May 7, 1253, on a secret mission for the French King. He was originally sent to the son of Batu Khan (q.v.), whose nomad camp was on the steppes between the Don and the Volga; then he visited Batu himself, by whom he was sent on to the Great Khan, in Mongolia. In all Rubruquis probably traveled more than 10,000 miles. On his return in 1255 he wrote for St. Louis the account of his journey. Later he met Roger Bacon in France. His only geographical authorities were Solinus and Isidore of Seville, whose statements he carefully tested by his own observations. His work is remarkably interesting and full of information on Asiatic geography, ethnology, anthropology, history of religions, and other subjects. Hakluyt (in 1598–99) and Purchas (in his *Pilgrimes*, 1625) published portions of Friar William's *Itinerarium*, but the first real edition was published in 1839 by the Société de Géographie of Paris (*Recueil de voyages et de mémoires*, vol. iv). There have been many translations; the best in English is by W. W. Rockhill (Hakluyt Society Publications, 2d series, No. 4, London, 1900). Consult Le Baron C. d'Ohsson, *Histoire des Mongols* (4 vols., The Hague, 1834); Oscar Peschel, *Geschichte der Erdkunde bis auf Alexander von Humboldt und Carl Ritter* (2d ed., Munich, 1877); F. M. Schmidt, "Ueber Rubruk's Reise von 1253–1255," in *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, vol. xx (Berlin, 1885); C. R. Beazley, *The Texts and Versions of John De Plano Carpini and William De Rubruquis* (London, 1903); id., *Dawn of Modern Geography*, vols. ii, iii (Oxford, 1906).

RU'BUS (Lat., bramble). A genus of perennial herbs and often subligneous stemmed shrubs of the family Rosaceæ. The fruit is edible in all, or almost all, the numerous species, which are natives chiefly of the colder parts of the Northern Hemisphere. The raspberry and bramble, or blackberry, and cloudberry (qq.v.) belong to the genus; *Rubus spectabilis*, the salmonberry found in British Columbia and southern Alaska, is a shrubby species, with large, dark purple, fragrant flowers. Its dark yellow or red, acid, somewhat astringent fruit is about the size of a blackberry and is extensively used as a dessert and for pies, etc. *Rubus saxatilis*, sometimes called the stone bramble, is a perennial herb, with pleasant fruit of few rather large drupes. It is a native of stony places in mountainous parts of Europe. *Rubus arcticus*, native to mountainous regions, is a small herb with rose-colored large flowers and purplish-red, exquisitely flavored fruit. *Rubus stellatus*, an Alaskan species known as knesheneka and morong, has a similar fruit. The dewberries resemble and are closely related to the blackberries.

RUBUYO, rōō-bōō'yō. See Jackal.

RU'BY (OF. *rubi, rubis*, Fr. *rubis*, Sp. *rubí, rubín*, from Lat. *ruber*, red). A red transparent variety of corundum much prized as a gem. The darker colors are wine red, carmine, or blood red, and most rubies have more or less of a blue or violet tint when viewed by trans-

mitted light. The most valuable shade is the deep, clear, carmine red, commonly termed pigeon's-blood red. Rubies of poorer quality are of a lighter shade, or may contain white spots, which in some cases disappear on heating. Unlike other gems the ruby can be heated to a high temperature without the red color being destroyed. Rubies are dichroic by transmitted light, and they possess the advantage of appearing equally brilliant by artificial or natural light. Rubies of large size are scarce and of high value, so that a three-carat stone of proper color and free from flaws is worth several times as much as a diamond of the same size. Among the largest rubies may be mentioned two belonging to the King of Bishenpur, in India, which weighed 50¾ and 17½ carats respectively. The largest ruby known is one from Tibet weighing 2000 carats, but it is not of first quality. Rubies are found in many localities, but most of the occurrences are of little value. The celebrated pigeon's-blood stones are obtained from Mandalay in Burma. The rubies are separated from the loose earth or byon by washing. Small rubies, generally of pink color, are found at Ratnapura in Ceylon, and others are obtained from Siam. They are also known to occur in Victoria and New South Wales, as well as in the Government of Perm, Russia. In the United States rubies have been found in stream gravels near Franklin, Macon Co., N. C., from which they are extracted by washing. Those found in Arizona and other Western States are not true rubies, but a variety of garnet. The same is true of the so-called Cape rubies found with the diamonds in South Africa. Rubies have been made artificially by fusing pure aluminium oxide with a small amount of oxide of chromium. These synthetic rubies, which are practically indistinguishable from the natural gems, are now being gradually placed on the market, their great beauty and relative inexpensiveness having caused a growing demand for them. Consult Bauer, *Edelsteinkunde* (Leipzig, 1896). See Synthetic Gems; Garnet.

RUBY MINES. A district of Upper Burma, India. See Mogok.

RUBY SILVER. See Proustite; Pyrargyrite.

RUBYTHROAT. The humming bird of the northeastern United States. See Humming Bird.

RUBY WEDDING. See Wedding Anniversaries.

RUCELIN, rụs'lăn'. See Roscelinus.

RUCELLAI, rōō'chĕl-lä'ē, Bernardo (1449–1514). An Italian historian, born in Florence. A brother-in-law of Lorenzo the Magnificent, whom he served in various public offices, he participated in the great philosophical and literary revival of his time. At his home first met the Platonic Academy, in the garden called after him the Oricellarii. His history *De Bello Italico*, dealing with the descent of Charles VIII upon Italy, was much admired by Erasmus and other contemporaries as a specimen of eloquence. Consult L. Passerini, *Genealogia e storia della famiglia Rucellai* (Florence, 1861).

RUCELLAI, Giovanni (1475–1525). An Italian poet, son of the preceding and nephew of Lorenzo de' Medici, born at Florence. He was appointed prothonotary apostolic and governor of the Castle of Sant' Angelo. His didactic poem *Le api* (1539), an imitation of the *Georgics* (book iv), is among the earliest specimens of the Italian *versi sciolti*, or unrhymed verse. His two tragedies, *Rosemunda* (1515) and *Oreste* (1525) (the latter based on the *Iphigenia* of Euripides), with the *Sofonisba* of Trissino, initiated the Italian tradition of the imitative and regular classic tragedy. Consult G. Mazzoni, *Opere di G. Rucellai* (Bologna, 1887).

RÜCKER, rụk'ẽr, Sir Arthur William (1848–1915). An English scientist and educator. He was educated at Brasenose College, Oxford, where he was a fellow in 1871–76, and in 1874 became professor of mathematics and physics in the Yorkshire College of Leeds. From 1886 to 1901 he was professor of physics in the Royal College of Science, London, and thenceforth until 1908 was principal of the University of London. Elected a fellow of the Royal Society in 1884, he received the society's Royal medal in 1891. He served as president of the Physical Society in 1893–95 and of the British Association in 1901, and in 1902 was knighted. His publications include: *On the Expansion of Sea Water by Heat* (1876), with Sir E. Thorpe; a series of papers on the properties of liquid films (1880–92), with Professor Reinold; *Magnetic Surveys of the British Isles for the Epochs 1886 and 1891* (2 vols., 1890–96).

RÜCKERT, rụk'ẽrt, Friedrich (1788–1866). A German poet, first known by his pseudonym Freimund Raimar, born at Schweinfurt. He was educated at Würzburg and Heidelberg and, after being an instructor at Jena, taught in various places and in 1816–17 was on the editorial staff of the *Morgenblatt* in Stuttgart. In 1826 he became professor of Oriental languages at Erlangen, went to Berlin in 1841 as professor, and in 1849 retired to his estate at Neuses, near Coburg, where he died. Rückert's first popularity was achieved by political poems, *Geharnischte Sonette* (1814), against Napoleon, but many of his lyrics are philosophical and contemplative. The most popular collections, however, are *Liebesfrühling* (1844), a book of beautiful love poems, and *Die Weisheit des Brahmanen* (1836–39). He turned much Oriental literature into admirable verse, notably Hariri's *Abu Seid* (1826), Firdausi's *Rostem und Suhrab* (1838), *Amrilkais* (1843), *Hamasa* (1846), and a portion of the Indian Mahabharata, *Nal und Damajanti* (1828). He also adapted Theocritus, Aristophanes, Sadi's *Bustan*, and the Indian drama *Sakuntala* to German taste. These were published posthumously. Rückert is unsurpassed as a translator. His poems reflect with wonderful fidelity the Oriental spirit and the verbal felicities of the Oriental style. His dramas are inferior to his lyrics. Rückert's *Werke* were collected in 12 volumes (Frankfort, 1868–69) and have also been edited by Laistner (Stuttgart, 1895–96), Beyer (Leipzig, 1900), Stein (ib., 1897), Ellinger (ib., 1897), and Linke (Halle, 1897). For his biography, consult Fortlage (Frankfort, 1867), Beyer (ib., 1868), Suphan (Weimar, 1888), and Muncker (Bamberg, 1890).

RUCKSTUHL, rụk'stōōl, F(rederick) Wellington (1853–). An American sculptor. He was born at Breitenbach, Alsace, but was only a year old when his family removed to America. He studied in Paris, chiefly under Mercié, and upon his return to America he established himself in New York. He soon achieved a prominent position among American sculptors, becoming the first secretary of the

National Sculpture Society and chief of the sculptural decorations at the St. Louis Exposition in 1904 and also taking an active part in many movements to encourage public art. Some of the most important examples of his work, which combines an able technique with a sincere and agreeable presentation, are the beautiful "Evening," in the Metropolitan Museum, New York, awarded a medal in Chicago in 1893; "Mercury," in St. Louis; "Solon," Congressional Library, Washington; the two figures "Wisdom" and "Force" at the entrance to the Appellate Court building, New York. Other works of a public character include the Confederate Monument in Baltimore, the "Defense of the Flag," at Little Rock, Ark., and the equestrian statues of Gen. J. F. Hartranft in Harrisburg, Pa., and Gen. Wade Hampton in Columbia, S. C. Characteristic portraits are those of John C. Calhoun in the capitol, Washington, and of John Russell Young. Ruckstuhl became a member of the Architectural League, New York, and of the National Institute of Arts and Letters.

RŪDAGĪ, rōō'dȧ-gē', or **RŪDAKĪ** (c.870–900–c.954). The earliest of the great Persian poets. He was born at Rudag, and according to legend was blind from his birth. Towards the end of his life he lost favor with his royal patron, Nasr II, and died in poverty, probably about 954. A few fragments of his poems have been preserved, mostly in anthologies and lexicons. His most important work was a translation into Persian of an Arabic version of the Pahlavi rendering of Bidpai (q.v.). To judge from the fragments which survive, his style was simple, comparatively free from the mannerisms of later Persian poetry, while in religion he seems to show the influence of Sufiism (q.v.). Consult: Ethé, "Rûdagî der Sâmânidendichter," in the *Göttinger Nachrichten* (1873); E. G. Browne, *Literary History of Persia* (New York, 1909); Horn, *Geschichte der persischen Literatur* (1901).

RUD'BECK, Olof (1630–1702). A Swedish scientist, born in Vesterås and educated at Upsala. There he studied natural science and at 23 discovered the lymphatic canal (*De Circulatione Sanguinis,* 1653), winning thereby a European reputation. After medical studies at Leyden he became professor at Upsala (1655) and made himself famous by his knowledge of botany, physics, and mathematics, and of archæology. With his son Olof (1660–1740) he published a great botanical atlas, *Campi Elysii* (2 vols., 1701–02). But his especial place is in the department of curious literature as the author of *Atland eller Manheim* (3 vols., 1677–98), in which he attempted to show that Sweden was the original Garden of Eden and Plato's Atlantis.

RUDDER. See Helm; Ship.

RUDDER FISH (so called from its habit of following vessels). A general name applied to a family (Centrolophidæ) of fishes of the open seas, allied to the pompanos and harvest fishes, which includes the black ruffs of the genus *Centrolophus* and the black rudder fish (*Palinurichthys perciformis*), the latter with the oblong form shown and blackish green in color. They are about 1 foot long. These fish gather in schools off the coast of the Northeastern States and have the habit of sheltering themselves under anything floating, as a log, a barrel, or boat, where they find not only some protection, but food in the form of hydroids, small barnacles, and other growths. Hence the name log-

RUDDER FISH (*Palinurichthys perciformis*).

fish, often applied to them. They are good eating.

Another rudder fish is the large amber fish (*Seriola zonata*), also called shark's pilot, and common from Cape Cod to Cape Hatteras.

RUD'DIMAN, Thomas (1674–c.1757). A Scottish scholar, born at Raggel, Parish of Boyndie, Banffshire, and educated at King's College, Aberdeen. He began his career as an editor by publishing an edition of Florence Wilson's *De Animi Tranquillitate Dialogus,* to which he prefixed a life of the author. In 1709 he published Arthur Johnstone's *Cantici Solomonis Paraphrasis Poetica.* In 1714 appeared his well-known work *Rudiments of the Latin Tongue,* a Latin grammar which at once superseded all others. In 1725–32 he published his *Grammaticæ Latinæ Institutiones.* As principal keeper of the Advocates' Library (1730) he published a magnificent edition of Anderson's *Diplomata et Numismata Scotiæ* (1 vol. folio). In 1751 he published an edition of Livy still known as the immaculate edition from its entire exemption from errors of the press. Consult his *Life* by Chalmers (1794) and J. E. Sandys, *A History of Classical Scholarship,* vol. ii (Cambridge, 1908).

RUDDY (or Rudder) **DUCK** (from AS. *rudu,* redness, from *rēodan,* to make red, from *rēad,* red). A small fresh-water duck, common throughout northern North America and visiting the southern part of the country in winter, noted among gunners for its skill in diving after the manner of grebes and for the length of time it can remain under water. This duck (*Erismatura rubida,* or *jamaicensis*) has the bill slaty blue, top of the head black, chin and sides of the head white, neck and upper parts bright chestnut, and the lower parts silky white. The female is duller in color.

RUDE, rụd, François (1784–1855). One of the foremost French sculptors of the nineteenth century. He was born at Dijon and studied at the local art school, but chiefly in Paris at the Ecole des Beaux-Arts under Cartellier. He received the Prix de Rome in 1812, and from 1815 to 1828 lived in Brussels. He returned to Paris in 1828 and exhibited his statue of "Mercury Fastening his Sandal" (Louvre) in the Salon. This was followed by his "Neapolitan Fisher Boy" (1831, Louvre), the first of that short series of striking masterpieces which have placed him in the first rank of French sculptors. Rude was undoubtedly a classicist in a large way, but in the "Fisher Boy" he shows himself quite capable of sympathizing with the Romantic school, then in its full vigor. From this time

(1831) his work became increasingly naturalistic, evolving into thoroughly modern realistic art. In 1830 Rude was first employed in the decoration of the Arc de Triomphe de l'Etoile, for the base of which he made designs for four great groups of sculpture; of these, however, he was allowed to execute only "Le Départ." Finished in 1836, it represents the departure of the volunteers in 1792 and is one of the most powerful and perfect works in sculpture produced in France. Compared with the "Départ" the rest of his production is mediocre, except perhaps the superb mortuary figure of Godefroy Cavaignac (1847, Montmartre Cemetery). Other statues by Rude are Louis XIII (1842) as a boy; "Awakening to Immortality"; "Maréchal de Saxe" (1838); "Napoleon" (1847); "Christ on the Cross" and "Joan of Arc" (1852, both in the Louvre); "Marshal Ney at Paris" (1853); "Hebe and the Eagle" and "Amor Victor," in the Museum of Dijon. The most complete biography of Rude is by Fourcaud in the *Gazette des Beaux-Arts* (Paris, 1888–91); see also Rosenberg, in Robert Dohme, *Kunst und Künstler des neunzehnten Jahrhunderts* (Leipzig, 1886), and Bertrand, *François Rude* (Paris, 1888).

RU'DENS (Lat., cable). A romantic comedy by Plautus, from the plot of which Shakespeare borrowed in *Pericles, Prince of Tyre.*

RU'DERAL PLANTS (from Lat. *rudus*, rubbish). Plants of roadsides and waste places. Close observation of ruderal areas shows that there is a rapid order of succession of the plant forms, commencing with annuals, largely because of the quick germination of their abundant seed. Then grasses and other perennial plants gradually crowd out the annuals, a change sometimes accomplished within 10 years. Naturalized plants (see NATURALIZATION) frequently gain foothold in ruderal areas, doubtless because the struggle is here somewhat less severe than in older and more established plant societies.

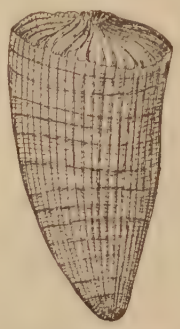
RÜDESHEIM, rụ'des-hīm. A town in the Province of Hesse-Nassau, Prussia, on the right bank of the Rhine, opposite Bingen. It is celebrated for its wine of the same name, the oldest brand of the Rhine wines. Pop., 1900, 4812; 1910, 5241.

RUDIÆ. See ENNIUS; LECCE (at end).

RUDIMENTARY STRUCTURES. See VESTIGIAL STRUCTURES.

RUDINI, rōō-dē'nē, ANTONIO STARRABBA DI, MARQUIS (1839–1908). An Italian statesman, born in Palermo. At 27 he was mayor of Palermo, in 1869 was for a short time Minister of the Interior, and subsequently was a member of the Chamber of Deputies until 1891, when he became Prime Minister. During his administration occurred the diplomatic tension with the United States over the killing of seven Italians by a New Orleans mob. His policy differed from that of his predecessor in its more conciliatory attitude towards France. He gave way to Giolitti in May, 1892, but after the Abyssinian disaster he was in 1896 recalled to the head of the ministry. His government went down in the disturbed Italian politics of 1898.

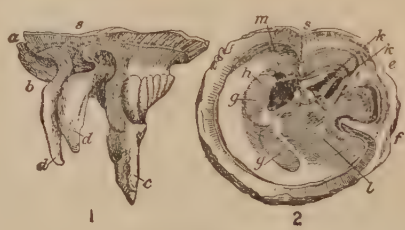
RUDIS'TÆ (Neo-Lat. nom. pl., from Lat. *rudis*, rough). A group of fossil marine lamellibranchs characterized by the great conical elongation of the right valve, which was attached to the sea bottom by its apex, and by the reduction of the left valve to the condition of a lidlike operculum in which no trace of the original spiral form of the shell remains. The Rudistæ occur in great abundance in some portions of the Middle and Upper Cretaceous of



HIPPURITES GOSAVIENSIS.

HIPPURITES CORNUVACCINUM.

Europe, Asia Minor, and Central America. The hinge of the shell has been entirely changed from its original form and now consists of a system of pegs on the upper valve, which fit into sockets in the lower valve and which permit the operculum to be raised and lowered in a vertical motion instead of in a rotary motion, as in the normal pelecypod. The principal genera are *Radiolites, Hippurites, Sphærolites,*



HIPPURITES RUDIOSUS.

1, upper valve; *s*, sinus of the hinge; *a*, *b*, grooves corresponding to anterior and posterior columns of the lower valve; *c*, anterior process of the clithrum; *d*, *d*, posterior processes of the clithrum. 2, interior of lower valve seen from above; *e*, *f*, position of anterior and posterior columns; *gg*, adductor scars; *h*, socket of anterior, and *kk* of posterior processes of clithrum; *l*, body-chamber of cell; *m*, vacant cavity near sinus.

and a large form, Barrettia, which attains a length of 2 feet. These most curious of pelecypods resemble corals so closely that they were formerly classed as such. Consult Bernard, *Eléments de paléontologie* (Paris, 1895).

RUD'MOSE-BROWN', ROBERT N. (1879–). A British scientist and Polar explorer, born at Clapham and educated at the universities of Aberdeen and Montpellier. He was assistant professor of botany in the University of Dundee (1901–02), assistant at the Scottish Oceanographical Laboratory (1905, 1906, and 1908), commissioner to investigate Burmese pearl fisheries (1907); geographical lecturer in the University of Sheffield (1908–15). In 1902–04 he served as naturalist to the Scottish National Antarctic Expedition, in the latter year receiving a medal from the Scottish Geographical Society, and in 1909 and 1912 he made explorations in Spitzbergen. Rudmose-Brown became a member of the International Polar Commission. Besides numerous scientific memoirs he was joint author of *Voyage of the Scotia* (1906) and of *Botany of the Scottish National Antarctic Expedition* (1912).

RU'DOLF, LAKE, or BASSO NOROK. A large lake in British East Africa, situated 200 miles northeast of the Victoria Nyanza (Map: Africa, H 4). It lies in the Great Rift valley and is about 185 miles long from north to south and 20 to 35 miles wide. It is bordered by high cliffs in the south; elsewhere the surrounding country consists either of rugged lava fields or sandy plains and is treeless, sterile, and forbidding. Several active volcanoes near by have sent their lavas to the shores of the lake. The lake is deep near the south end and shallow in the north, where the Omo or Nianam River enters it through a marshy delta. As there is no outlet, the water is brackish. The lake was discovered by Teleki in 1888. In 1907 the north end was assigned to Abyssinia.

RUDOLF OF EMS (?–1254). A German poet, born probably in Hohenems, of the school of Gottfried von Strassburg. He died in Italy in the service of Conrad IV. Rudolf's earliest work was *Der gute Gerhard* (ed. by Haupt, Leipzig, 1840). More famous was the story of *Barlaam und Josaphat* (c.1225; ed. by Pfeiffer, Leipzig, 1843). He also wrote a *Weltchronik*, based for the most part on the Old Testament and coming down only to the death of Solomon. In a revised form it had a great vogue up to the time of Luther's version of the Bible, being practically the only form in which the earlier part of the biblical story was available for the common people.

RU'DOLPH I (1218–91). King of Germany and head of the Holy Roman Empire from 1273 to 1291, founder of the present house of Austria. He was the son of Albert IV, Count of Hapsburg and Landgrave of Alsace. Through inheritance, through his marriage with Gertrude, Countess of Hohenberg, and by successful wars with his neighbors, he became the most powerful prince in the extreme southwest of Germany, with possessions in Switzerland, Swabia, and Alsace. He acquired a great reputation for bravery, wisdom, and fair dealing. During the Great Interregnum, which began in 1256, Germany was without an acknowledged head. In 1272 Pope Gregory X, alarmed at German disunion, used every means in his power to force an Imperial election. The great Rhenish princes, in whose hands rested the power of election, wished to find some one who would not be strong enough to excite jealousy. Their choice fell on Rudolph of Hapsburg, and he was crowned at Aix-la-Chapelle, Oct. 24, 1273. Rudolph's most formidable opponent was Ottokar, King of Bohemia, who refused allegiance. Rudolph made war upon him and forced him to give up the duchies of Austria, Styria, Carinthia, and Carniola (1276).

Ottokar, having renewed the war, was defeated and slain in a battle on the Marchfeld (1278). The Emperor in 1282 invested his sons, Albert and Rudolph, with the territories wrested from Ottokar. (See AUSTRIA-HUNGARY.) Rudolph did a great service to Germany in suppressing the robber barons and destroying their strongholds. He is said to have condemned to death 30 nobles and to have razed to the ground twice that number of castles. His efforts to preserve peace by prohibiting private wars were very acceptable to the towns and lesser nobles, but the lack of effective police and judicial organizations prevented the execution of his laws. Moreover, he antagonized the towns by attempting to raise an Imperial revenue by taxation.

Consult: Ottokar Lorenz, *Geschichte Rudolfs von Habsburg und Adolfs von Nassau* (Vienna, 1866–67); Aloys Schulte, *Geschichte der Habsburger* (Innsbruck, 1887); A. Zisterer, *Gregor X. und Rudolf von Habsburg* (Freiburg, 1891); Oswald Redlich, *Rudolf von Habsburg* (Innsbruck, 1903).

RUDOLPH II (1552–1612). Holy Roman Emperor from 1576 to 1612. He was the eldest son of the Emperor Maximilian II and was educated in the Spanish court by the Jesuits. He was weak and little concerned with government, which he left in the hands of the leaders of the Counter-Reformation. The liberalizing tendencies which had been at work in the Austrian dominions under his predecessor came to an end. Intolerance and persecution on the part of Rudolph aroused bitter discontent, and in 1604 an insurrection broke out in Hungary. Matthias, the younger brother of Rudolph, put himself at the head of a formidable party against the Emperor and in 1608 forced him to cede to him the government of Austria, Hungary, and Moravia. In 1609 Rudolph was forced to issue the Majesätsbrief, guaranteeing the Bohemians religious freedom, but at the same time preparations were already going on for the great struggle that was to break out in less than a decade. In 1608 the Evangelical Union was formed by some of the German states for the defense of the Protestant religion, and this was followed by the organization of the Catholic League in 1609. In 1611 Bohemia was taken from Rudolph and transferred to Matthias. (See THIRTY YEARS' WAR.) Rudolph's taste for astrology and the occult sciences, and his desire to discover the philosopher's stone, led him to extend his patronage to Tycho Brahe and Kepler. The important astronomical calculations begun by Tycho and continued by Kepler, which are known as *The Rudolphine Tables*, derive their name from this Emperor. Consult Gindely, *Rudolph II. und seine Zeit* (Prague, 1863–65), also H. C. Bolton, *Follies of Science at the Court of Rudolph II., 1576–1612* (New York, 1904).

RUDOLPH (1858–89). Archduke and Crown Prince of Austria, son of Francis Joseph I. He was educated carefully and entered the army in 1878. An enthusiastic hunter and traveler, he was the author of *Fünfzehn Tage auf der Donau* (1881) and *Eine Orientreise* (1884). He planned and partly edited the work *Die österreichisch-ungarische Monarchie in Wort und Bild* (1886–1902). Rudolph married Stephanie, daughter of Leopold II of Belgium, in 1881. Under circumstances never explained he was found dead in his shooting lodge at Meyerling, near Baden.

RUDOLSTADT, rōō'dōl-stät. The capital of the Principality of Schwarzburg-Rudolstadt, Germany, on the Saale, 18 miles south of Weimar (Map: Germany, D 3). Its most beautiful church is the thirteenth-century Stadtkirche, rebuilt in the seventeenth century and restored in 1879. The castle has been the residence of the Prince since 1599. The city has a palace with a natural-history collection, a Gymnasium, a national seminary, and a library of 66,000 volumes. It manufactures porcelain, pianos, metal and wooden artistic cabinetwork, children's blocks, chocolate, essential oils, and chemicals. Rudolstadt is first mentioned in the year 800. It came into possession of Schwarzburg in 1355. Pop., 1900, 12,407; 1910, 12,904.

RUDRA, rōō'drȧ (Skt., howler, or perhaps, red, bright), or MAHADEVA. A deity of Vedic India. He is described as a shining archer bearing the lightning shaft or as clad in a skin. Oftentimes he is said to be red in color or to have a blue neck or belly, while his eyes are 1000 in number. He is associated most frequently with the Maruts (q.v.), although in some passages he is identified with Agni (q.v.) or with Vishnu (q.v.). His character is twofold. For the most part he is represented as a terrible deity, mighty and malevolent, to whom prayer must be offered to induce him to avert his shafts both from men and animals, while disgraceful attributes are assigned to him in the later Vedic period. On the other hand, Rudra is a divinity of healing, and his blessings are besought repeatedly. In the post-Vedic period the place of Rudra in the Hindu pantheon has been usurped by Siva (q.v.). Consult: Muir, *Original Sanskrit Texts* (London, 1868–74); A. A. Macdonell, *Vedic Mythology* (Strassburg, 1897); L. D. Barnett, *Antiquities of India* (London, 1913).

RUE (OF., Fr. *rue*, from Lat. *ruta*, from Gk. *ῥύτη, rhutē*, rue), *Ruta*. A genus of about 50 species of half-shrubby plants of the family Rutaceæ, natives of southern Europe, northern Africa, the Canary Isles, and the temperate parts of Asia. Common rue or garden rue (*Ruta graveolens*) grows in sunny stony places in Mediterranean countries and is cultivated in American gardens. It has greenish-yellow flowers and glaucous evergreen leaves with small oblong leaflets, the terminal leaflets obovate. It

RUE (*Ruta graveolens*).

was formerly called herb of grace (see *Hamlet*, Act iv, Scene 5), because it was used for sprinkling the people with holy water. It was in great repute as an amulet against witchcraft in the time of Aristotle. The smell of rue when fresh is strong and to many disagreeable, yet it is used in some parts of Europe in cookery. Some of the species found in northern India are similarly used. Goat's rue is *Tephrosia virginiana*, and meadow rue *Thalictrum polygamum*.

RUE CROWN. A Saxon order founded in 1807 by Frederick Augustus I and intended as a distinction for high state officials. The cross is green with white edges and has golden rue leaves between the arms. The medallion is surrounded by a wreath composed of 16 rue leaves and bears the initials of the founder; with the motto *Providentiæ Memor.*

RUEDA, rōō-ā'dȧ, LOPE DE (?1510–?65). A Spanish dramatist, born in Seville, where he was a goldbeater for some time. It seems probable that he was a versatile actor and manager of his troupe. He was the first popular dramatist of Spain. His works include four *comedias*, mostly from Italian sources, where there is much pleasant fooling and a plot usually hinging on mistaken identity. Rueda also wrote bucolic dialogues, which are somewhat stiff, and 10 *pasos*, all drawn from everyday characters. In these 10 prose interludes we find the real Rueda. His complete works were published by the Marquis de la Fuensanta del Valle in vols. xxiii and xxiv of the *Colección de libros españoles raros ó curiosos* (Madrid, 1895–96), and by Emilio Cotarelo y Mori in the *Biblioteca selecta* of the Royal Spanish Academy (2 vols., ib., 1908). Consult also Emilio Cotarelo y Mori, *Estudios de historia literaria de España*, vol. i (ib., 1901), and S. Salazar, *Lope de Rueda y su teatro* (Santiago de Cuba, 1911).

RUEDEMANN, rōō'de-mȧn, RUDOLF (1864–). An American paleontologist, born at Georgenthal, Germany. He was educated at Jena (Ph.D., 1887) and at Strassburg (Ph.D., 1889), where he was an assistant in geology in 1887–92. In 1892–99 he taught in the high schools at Lowville and Dolgeville, N. Y., and then became assistant State paleontologist. His investigations deal with the graptolites, guelph beds, cephalopods, and eurypterids of New York and with the fossils and geology of the Lower Silurian. Ruedemann was a contributor to the NEW INTERNATIONAL ENCYCLOPÆDIA.

RUEF, rōōf, ABRAHAM ("ABE") (?–). An American political boss, born in San Francisco. He graduated from the University of California in 1884 and was admitted to the bar in 1886. In 1899 he organized the Republican Primary League and in 1901 succeeded in making Eugene F. Schmitz (q.v.) mayor of San Francisco. Ruef was involved in graft operations that became a public scandal. Finally Rudolph Spreckels (q.v.) financed a citizens' reform movement, and after a legal battle of three years Ruef was convicted of bribery (1911) and sentenced to nine years in San Quentin prison. In 1915 he was paroled on condition that he never reënter politics and that he remain out of San Francisco for three months. For further details, see CALIFORNIA, *History*. Consult the article on California in the NEW INTERNATIONAL YEAR BOOK for 1907–08.

RUEL'LIA (Neo-Lat., named in honor of Jean Ruel, a French botanist of the sixteenth century). A large genus of plants of the family Acanthaceæ, mostly natives of tropical and subtropical Asia and Australia. Some beautiful species are cultivated for ornament in hothouses. In Assam and in some parts of China *Ruellia indigofera*, called by some botanists *Strobilanthes flaccidifolius*, is much cultivated for the excellent indigo which it yields. A few species, especially *Ruellia strepens* and *Ruellia ciliosa*, with large blue or purple attractive flowers, are natives of the United States.

RUFF, or **REEVE** (probably from *ruff*, abbrev. of *ruffle*, from MDutch *ruyffelen*, to wrinkle; so called because of the neck ruff). A European snipe (*Machetes pugnax*), noted for pugnacity. It is about a foot in entire length and in color ash brown spotted or mottled with black; the head, a prominent erectile ruff of neck feathers, and the shoulders are black

glossed with purple and variously barred with chestnut. The female (the reeve) is mostly ash brown with spots of dark brown, is much more

RUELLIA (*Ruellia ciliosa*).

uniform in color than the male, and lacks the ruff. See PHEASANT, and Colored Plate of SHORE BIRDS.

RUFFED GROUSE. See GROUSE.

RUF'FIN, EDMUND (1794–1865). An American agriculturist, born in Prince George Co., Va. He attended William and Mary College from 1810 until 1812, and then, on the outbreak of war with England, enlisted in a volunteer company. After scarcely six months' service, however, he returned to the estate left him by his father and thenceforth devoted himself to agriculture. He made a number of experiments which resulted in the discovery of the value as a fertilizer of the great deposits of marl in eastern Virginia. In 1833 he founded the *Farmer's Register*, a pioneer in arousing interest in scientific farming. In 1842 he was appointed agricultural surveyor of South Carolina, and later he founded the Virginia State Agricultural Society, of which he became president. His most important published work is *An Essay on Calcareous Manures* (1831), which passed through five editions. As the oldest member of one of the military organizations which besieged Fort Sumter, he fired the first shot of the war at half-past four o'clock, Friday morning, April 12, 1861. Four years later, when the conflict ended, he committed suicide rather than give his allegiance to the United States. Consult *Yearbook of the United States Department of Agriculture* (Washington, 1895).

RUFFINI, rụf-fē'nē, GIOVANNI (1807–81). An English writer of Italian origin, born in Genoa. He studied in his native city and came to know Mazzini, whose "Young Italy" (q.v.) he joined in 1833. He fled from Italy and from 1836 to 1842 lived in England. He then went to France. The revolutionary movement of 1848 permitted his return to his native land, and he entered the Sardinian Parliament in that year, becoming in 1849 Sardinian representative at Paris. After the battle of Novara he returned to England and devoted himself to the writing of novels. He published *Doctor Antonio* (1855), *Dear Experience* (1878), *Lavinia* (1860), *Vincenzo* (1863), and other works. His autobiography appeared in 1853 under the title *Passages in the Life of an Italian.*

RUFFO, rōōf'fô, FABRIZIO (1744–1827). Italian Cardinal and general. He was born in Calabria, a descendant of the ducal family of Barnello, and was trained as a priest. In 1794 he was made Cardinal. Afterward he entered the Neapolitan service and offered stubborn and successful resistance to Championnet, who at the head of a French army attempted to capture Naples. Having gathered a large number of Royalists in Calabria, with the aid of the celebrated brigand chief Fra Diavolo (q.v.), he expelled the French and the Republicans from the country and restored King Ferdinand I to the throne in 1799. But later, together with Pope Pius VII, he was taken a captive into France, whence he returned in 1814.

RUFIJI, rōō-fē'jē. A river in Africa (Map: Congo, G 4). It is formed by the junction of the Luvegu and Ulanga and flows northeastward and then eastward, entering the Indian Ocean through a large delta 120 miles south of Zanzibar. The head streams rise on the Livingstone Mountains northeast of Lake Nyasa and flow through a sparsely inhabited forest country. Some distance below the confluence the Rufiji receives the Ruaha, which rises north of Lake Nyasa and exceeds the main stream in length. The Rufiji is navigable for small steamers up to the Shugali Falls below the confluence of its head streams, above which the Ulanga is again permanently navigable for the greater part of its course. The delta is a good rice area.

RUFI'NUS, TYRANNIUS (c.345–410). A Latin presbyter and theologian, born at or near Aquileia in Venetia. About 373 he attended lectures under Didymus at Alexandria, Egypt, and about 379 went to live in Palestine, where he founded a monastery at the Mount of Olives. In 394 he was made a presbyter by Bishop John of Jerusalem. When the controversy broke out in the same year over the doctrines of Origen, Rufinus quarreled with Jerome, who had been his friend. In 397 he went to Rome and there had great influence on Western theology by his translations of the Greek Fathers. His translations include the *Canon Paschalis* of Anatolius Alexandrinus, Basil's *Homilies*, the *Clementine Recognitions*, the *Opuscula* of Gregory of Nazianzus, Origen's *Principia* and *Homilies*, the *Apology* of Pamphilus, and the *Sententiæ* of Sixtus. He wrote independently *Apologia pro Fide Sua ad Anastasium Pontificem*, *Historia Eremitica*, and *Expositio Symboli.*

RUG'BY. A market town in Warwickshire, England, 15 miles northeast of Warwick (Map: England, E 4). It is an important junction of five different railways. It derives its celebrity from Rugby School (q.v.), founded in 1567. Pop., 1901, 16,830; 1911, 21,758. Consult Bloxham and Smith, *Rugby: Its School and Neighborhood* (London, 1889).

RUGBY. A town in Morgan Co., Tenn., 7 miles from Rugby station on the Cincinnati Southern Railroad and 114 miles north of Chattanooga. The town was founded in the expectation of developing an ideal community. The first steps were taken by New England capitalists, who soon transferred the enterprise to an English company, which invested £150,000 in a tract of 50,000 acres and improvements. The site was ready in 1880, and a colony of English farmers took possession. The plan contemplated

a combination of industrial activity with attention to culture and out-of-door English sports, such as cricket and hunting, and it was expected that the colony would consist of both American families and the sons of English farmers of the better class in fair circumstances. It was, however, never successful, and after a few years the distinctive features of the colony were abandoned. The town is now a popular health resort.

RUGBY. See FOOTBALL.

RUGBY SCHOOL. A famous public school, situated at Rugby, England, founded in 1567 under the will of Lawrence Sheriffe as a free school for the children of Rugby and Brownsover. Edward Rolston was appointed the first master in 1574. Up to 1667 the school remained in comparative obscurity. Its history during that trying period is characterized mainly by a series of lawsuits between descendants of the founder, who tried to defeat the intentions of the testator, and the masters and trustees, who tried to carry them out. A final decision was handed down in 1667, confirming the findings of a commission in favor of the trust, and henceforth the school maintained a steady growth. Under the vigorous administration of Francis Holyoake, headmaster from 1688 to 1731, Rugby assumed considerable importance among English public schools, there being at one time an enrollment of more than 100 pupils. Thomas James, an Etonian by education, was elected headmaster in 1778. He was an accomplished scholar in classics and mathematics and a firm disciplinarian. He introduced exhibitions, forms, tutors, præpostors, and fags, and in general all the methods in vogue at Eton. At the end of his régime (1794) the attendance was about 200. James was the first real organizer of Rugby as we find it to-day, while Thomas Arnold (q.v.), as headmaster from 1829 to 1842, impressed upon it the character that marks all English public schools.

Since his death in 1842 the successive masters have with more or less success striven to maintain the high standard set up by Arnold. The studies at Rugby are still mainly classical. The modern tendencies are, however, fast making an inroad into the school curriculum. The school has an attendance of about 600, distributed among the classical, specialist, and modern "sides" and the army class. The principal buildings are the Rugby and New Big Schools, built in quadrangles; the chapel, the gymnasium, and the museum. The Close is the principal playground and contains about 17 acres, the most popular game being football. Rugby includes also a library, a laboratory, a vivarium, and a workshop. The *Meteor* is the principal publication. By far the best known of English public schools, Rugby owes its celebrity in part to the truthful picture of the school life of real boys as drawn by one of her sons, Thomas Hughes, in his classic *Tom Brown at Rugby*. Consult W. H. D. Rouse, *History of Rugby School* (London, 1898).

RUGE, rōō'ge, ARNOLD (1802–80). A German political agitator and miscellaneous writer, born at Bergen, island of Rügen. He studied at Jena and Halle, shared in the student agitations of 1821–24, was imprisoned (1824–30), became privatdocent at Halle (1832), founded the *Hallesche Jahrbücher* (1837) as an organ of the Young German Hegelians, and on its suppression by the Prussian censorship he went to Paris (1843–45) and later to Switzerland. He then became a bookseller and publisher in Leipzig, issued a Democratic journal, *Die Reform*, was elected to the Frankfort Parliament (1848), and in the next year he fled to England. He aided Mazzini and Ledru-Rollin in organizing the Central European Democratic Committee (1849) and from 1852 lived in Brighton, teaching and writing. He wrote, among other things, a *Manifest an die deutsche Nation* (1866) and *Geschichte unserer Zeit* (1881). In 1877 he was pensioned by the German government. His autobiography, *Aus früherer Zeit*, appeared in Berlin (1863–67); his *Letters* were edited by Nerrlich (ib., 1885–86).

RÜGEN, rų'gen. The largest of the islands of Germany, situated in the Baltic Sea off the coast of Pomerania, from which it is separated by the Strelasund, 1 mile wide (Map: Germany, E 1). It is 33 miles long from north to south and 26 miles wide and has an area of 373 square miles. It is of extremely irregular shape, the northeastern portion being separated from the remainder by a deep and irregular inlet known as the Jasmunder Bodden. It is level in the west and hilly in the east, nearly the whole eastern coast consisting of deep chalk cliffs rising in one place to a height of 528 feet. The good sea bathing attracts many visitors. The soil is fertile, producing grain and rapeseed; cattle raising and herring fisheries are also important. Pop., 1900, 46,270; 1910, 48,514. The chief town is Bergen. Rügen was taken possession of by Valdemar I of Denmark in 1168 and was united with Pomerania in 1325. In 1648 it passed to Sweden and in 1815 was acquired by Prussia, to which it still belongs. Consult Von Arnim, *Journey about Rügen* (New York, 1905). See ARKONA.

RUGER, rōō'gẽr, THOMAS HOWARD (1833–1907). An American soldier, born at Lima, N. Y. He graduated at West Point in 1854 and was assigned to the engineers, but resigned a year later and became a lawyer at Janesville, Wis. On the outbreak of the Civil War he reentered the service as lieutenant colonel of the Third Wisconsin Volunteers and during the first half of the war participated in the campaigns in Virginia, Maryland, and Pennsylvania, becoming brigadier general of volunteers in November, 1862. In 1864 he commanded a brigade of the Twentieth Corps during the invasion of Georgia and later commanded a division of the Twenty-third Corps in the Tennessee campaign against Gen. John B. Hood (q.v.) and for his gallantry at the battle of Franklin received the brevet rank of major general of volunteers. After the war he was commissioned colonel of the Thirty-third Infantry of the regular army in July, 1866, and in 1871 was appointed superintendent of the United States Military Academy, where he remained until 1876. He was promoted brigadier general, U. S. A., in March, 1886, major general in February, 1895, and was retired from the service in May, 1897.

RUGGERI, VINCENZO GIUFFRIDA-. See GIUFFRIDA-RUGGERI, VINCENZO.

RUGGLES, SAMUEL BULKLEY (1800–81). An American lawyer, born in Connecticut. He graduated at Yale in 1814 and was admitted to the New York bar in 1821. In 1838 he was elected a member of the State Legislature. In 1839 he was chosen as a canal commissioner and the following year became president of the canal board, an office which he held again in 1858. He represented the United States in the

international monetary conference in Paris and was a delegate to the statistical conference at The Hague in 1869.

RUGGLES, Timothy (1711–95). An American jurist and soldier, born at Rochester, Mass. He graduated at Harvard in 1732, studied law, and became a foremost lawyer of the Colony. He was a judge of the Court of Common Pleas for Worcester County in 1757 and five years later its Chief Justice. For many years he was a member of the General Court. When the French and Indian War began, he entered the army, was second in command at the battle of Lake George in 1755, was made a brigadier general, and in 1759–60 took part under General Amherst in the conquest of Canada. As a reward for his services he was given a farm by Massachusetts and later was appointed to the office of surveyor-general of the King's forests. In 1765 he was president of the Stamp Act Congress, but, having refused to transmit to England the addresses and petitions drawn up by that body, he was censured by the Massachusetts General Court and reprimanded by the Speaker. In 1774 he received an appointment as mandamus counselor, and, as he expressed his intention to serve, was forced to seek safety in Boston. When the British evacuated that city, he accompanied them and ultimately settled in Nova Scotia. Consult Emory Washburn, *Sketches of the Judicial History of Massachusetts from 1630 to the Revolution in 1775* (Boston, 1840), and L. R. Paige, *History of Hardwick* (ib., 1893).

RUGS, Oriental (Swed. *rugg*, rough, tangled hair; probably connected with LG. *rug*, OHG. *ruh*, Ger. *rauh*, AS. *ruh*, *rug*, Eng. *rough*. For European and domestic rugs, see Carpets and Rugs). Oriental rugs is the term used to describe rugs made in the Orient—Chinese, Bokhara, Caucasian, Turkish, Persian, and Indian. Most of these rugs have a velvet pile, but Kelims are woven flat like tapestry, while Cashmeres have a flat surface with a technique quite their own. In England a large rug is called a carpet. In the United States the word "rug" is used to designate all floor coverings of less than room size. While many domestic rugs are composed of strips of carpeting sewed together, Oriental rugs are always made in one piece. Oriental rugs are made by knotting short pieces of worsted or silk yarn around pairs of warps. In the Ghiordes knot the process is as if a short piece of yarn were laid over a pair of warps with ends hanging down; the ends are then pulled up between the pair of warps and drawn tight. In the Sehna knot both ends of the yarn do not come up between the pair of warps, but one between, the other outside.

The warp of Chinese rugs is always of cotton; both wool and cotton are employed by the Persians, but cotton mostly. Bokhara, Caucasian, and Turkish rugs usually have a woolen warp; but as rugs with woolen warp are apt to be crooked, on account of the elasticity of the wool, cotton is being used more and more, especially for the large rugs made to order for the European and the American markets.

There is a tendency for rugs made in a particular place to be made in a particular manner, although the introduction of machine-made methods into hand-knotted rugs has begun to take all character and individuality out of these products. Even when aniline dyes have not been used instead of vegetable dyes, the patterns and designs are so standardized that the rugs are monotonous. Such rugs are those from the Sultanabad district, especially Muskhabads, Mahals, and Savalans. Practically all modern Oriental rugs sold in the United States and Europe to-day have been washed or overdyed. When the washing or overdying is skillfully done the appearance of the rug is improved without injury. When it is badly done the rug is spoiled. Many rugs are sold at bargain prices in the shops because they have been spoiled in washing. Even when they still look well they have often lost all wearing power and will disintegrate within a few months.

The character of the design also distinguishes rugs of different countries and different districts. Especially individual are the Chinese designs, with their dragons, kylins, and lion dogs, the animal signs of the Chinese zodiac, and the Chinese designs emblematic of the literati, of the immortals, and of Buddhism. These various emblems and animals are pictured by the Chinese with wonderful vividness and naturalism and yet conventionalized most artfully. The motifs are apt to be detached and on a plain ground, except in the earlier rugs that frequently had a geometrical background. The ancient Chinese rugs that still survive date from the seventeenth and eighteenth centuries and the first half of the nineteenth. Those from the seventeenth century are more primitive, with geometrical effects, both straight-line and large-curve patterns; the designs of the eighteenth century are much more naturalistic than those of the seventeenth century. Between the Chinese style of Kang-hi and his European contemporary, Louis XIV, there is a very striking analogy. There is also a very striking analogy between the Chinese style of Kien-lung and his European contemporary Louis XV. Kien-lung designs show the same lack of balance that is so distinctive of the rococo period. Chinese rugs are looser in texture than any others and very coarse. The dominant colors, at least those which first strike the European, are the grayed blues, yellows, and creams. Besides these there is a wealth of delicate pastel pinks, roses, blues, and elusive shades borrowed from Chinese silks and porcelains. Samarkands are a cross between the rugs made in China and those made in Persia.

The Bokhara group of rugs made in Russian Central Asia is extremely interesting. These rugs more than most others have preserved the original type. They are made mostly by seminomadic tribes, from 500 to 1000 miles east of the Caspian Sea. Bokhara rugs are distinguished by extremely wide selvages and long fringes at the ends. The motifs are large and geometrical, and the dominant color is dark red outlined with white or black.

Caucasian rugs are distinctly lighter in tone than those of Bokhara. The designs are uniformly geometrical, especially those of Daghestan, with stars and latch hooks. Caucasian rugs are woven, or rather knotted, in the Russian Caucasus between the Caspian and the Black seas. The finest and best, with the most intricate designs, and with straight-line effects dominant, are those made in Daghestan. Other Caucasian rugs are those named from the Province of Shirvan; those that get the name Kazak from the wandering Cossacks who make them; the Guenjes, that resemble the Kazaks, but are inferior in quality; the Cabistans, that resemble

the Daghestans and the Shirvans, but are long and narrow. The Shirvans, though similar in design to the Daghestans, are of coarser weave and of inferior quality. The so-called Cashmeres, or Soumaks, are made around the city of Shemaka, from which they get the name Soumak. These are made, not by knotting like the pile rugs and not by weaving in the tapestry fashion, but by twisting the weft thread around warps, over four and back under two. The surface of these Soumak rugs is very distinctive, with its straight lines and somewhat whitish effects.

The designs of Turkish rugs are also rectilinear, but not to such an extreme extent as those of Caucasian rugs. A few years ago almost all American collections of antique Oriental rugs consisted of Ghiordes, Kulah, Melez, Bergamo, and other Turkish rugs which were apt to be referred back to the sixteenth or seventeenth century, although most of them were of the eighteenth century and some of the nineteenth. They are very interesting and excellent small rugs, but not at all equal in quality or design to the famous Persian, Armenian, and Turkish rugs of the fifteenth and sixteenth centuries, of which there are on exhibition at the Metropolitan Museum, New York, a number of important examples. Most of the modern rugs made in Turkey are of an inferior type, except the large ones made from Persian wools in the Sultan's works at Hereke.

Persia is of course the real home of the Oriental rug. The finest rugs made in the world, in past centuries as well as to-day, come from Persia. There are no others worthy to compare with the splendid Ispahan creations of the sixteenth century, or with wonderful animal rugs like the three from the mosque at Ardebil, the largest one of which is in the South Kensington Museum; one of the smaller ones is in the Metropolitan Museum, acquired at the sale of the Yerkes collection. Persian rugs represent the most successful conventionalization of flowers, leaves, and other vegetation that the world has ever known. The designs retain a vivid naturalism, though flattened so that they conform completely to the demands of the texture of pile rugs. The so-called "hunting rugs" were made mostly in the sixteenth century, and many of them are exquisitely and beautifully illustrated in the famous Imperial Austrian rug book, named below; these rugs, with rich floriation and active animal life, suggest, or rather resemble closely, the millefleur tapestries of the late fifteenth and early sixteenth century in Flanders. The different districts of Persia all have their different types of rugs. Among the finest and most interesting rugs that come from Persia are the Kashans, with their exquisitely fine texture and well-balanced design, usually with centre medallion; the Kirmans, with their splendid wealth of all-over florals and soft-grayish surface; the Kurdistans, especially the long narrow ones with the Mina Khani design, showing a deep-blue field with red, yellow, and parti-colored flowers connected by green vines and alternating in diamond arrangement; the Saruks, that might well be described as the Ispahans of the present day; the Hamadans (named from the city where they are made, which is Hamadan, anciently Ecbatana, that was the capital of the ancient Empire of the Medes), with their outside borders of camel's hair and frequent introduction of camel's hair into the field; Shirazes, with barber-pole stripes, bright-colored overcasting of the edges, and wide selvage at the end; the Feraghans, with the Herati border, and frequent use of the Herati motif in the field; the Serebends, with field consisting of the pear design in rows, with the stems of alternate rows turned in the opposite direction; the Sehnas, with their extraordinarily delicate and fine texture and intricate patterns and short pile; the Mesheds and the Khorassans, with their soft silky piles and dark ground. Until recently we also had from Persia Tabrizes, with hard-woven surface and stiff backs, showy large centre medallions on floral ground; also Gorevans, Serapes, and Bakhshis, all woven in the Herez district in the extreme north of Persia. Of these three types the Serapes are the finest, the Gorevans the average quality. All were made in large sizes to supply the modern demand.

In the seventeenth century northwestern India wove rugs of the most splendid type, inspired from famous Persian originals. When the industry was revived about 1890, artistic success was not immediate. For a long time the modern rugs made in India were justly regarded as much inferior to those made in Turkey and in Persia. But between 1910 and 1915 a great improvement took place. Reproductions not only of fine Persian rugs, but also of fine Chinese rugs that compare favorably with any, are now made in India. Among the most interesting of the carpet-size Oriental rugs now made are those that come from Bulgaria, where the industry has been developed by an Armenian firm resident in America.

Formerly there were many disputes over the origin of the so-called Polish rugs, which were supposed to have been made in Poland. Closer study and investigation, however, have shown that these Polish rugs were made in Persia in the first half of the seventeenth century, to be sent as presents by the Shah to the rulers of Sweden and other European potentates. There are a number of these Polish rugs in American private collections and several in the Metropolitan Museum of Art, notably two in the Altman collection. Many of them are rich with silver and gold.

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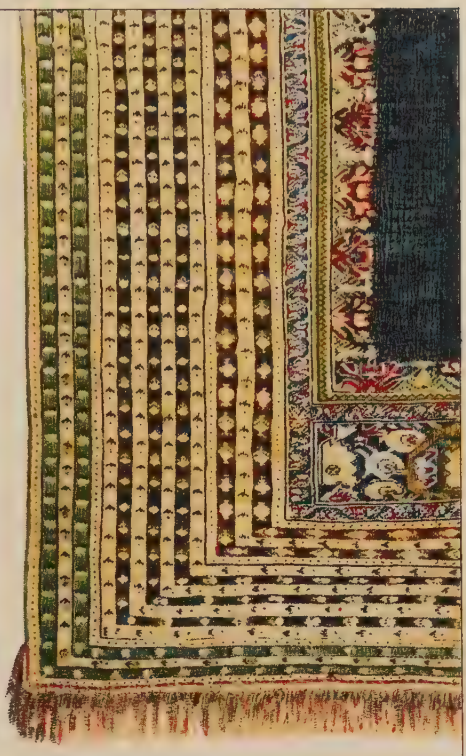
CAUCASIAN
CABISTAN



TURKISH
ANTIQUE GHIORDES

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PUNJAB INDIA
BEECHAPORE DESIGN

PERSIAN OR IRAN
FERRAHAN, HERATI DESIGN

Antique and Modern (New York, 1913); J. K. Mumford, *Oriental Rugs* (rev. ed., ib., 1915).

RUHMKORFF, rụm'kôrf, Heinrich Daniel (1803–77). A German physicist and instrument maker, born at Hanover. In 1848 he founded at Paris an establishment for the manufacture of instruments and scientific apparatus. He is known especially as the inventor of a form of induction coil which he invented in 1851. In 1864 he was awarded a grand prize of 50,000 francs for his applications of electricity.

RUHNKEN, rōōn'ken, David (1723–98). A German classical scholar. He was born at Stolpe, Pomerania, and studied at Wittenberg and Leyden. He prepared a new edition of Plato and published an excellent edition of Timæus' *Lexicon Vocum Platonicarum* (1754). In 1761 he was appointed to the chair of eloquence and history at Leyden. Ruhnken's chief service was in establishing university instruction in Greek throughout the Netherlands upon the same basis as that in Latin. There are three collections of his letters, and his life has been written by his famous pupil Wyttenbach (Leyden, 1799; last ed., Freiburg, 1846). Consult J. E. Sandys, *A History of Classical Scholarship*, vol. ii (Cambridge, 1908).

RUHR, rōōr. A river of West Prussia, entering the Rhine near Duisburg, after a course of 145 miles (Map: Germany, B 3). Flowing through a region rich in coal and near vast iron-ore mines, the Ruhr valley lies in the midst of the important iron and steel manufacturing plants of the Kingdom.

RUHR BASIN. See Volume XXIV.

RUHRORT, rōōr'ôrt. A town in the Rhine Province, Prussia, at the junction of the Ruhr and the Rhine, 12 miles west of Essen. It has the largest river harbor on the continent of Europe and possesses immense shipbuilding docks. The manufactures include machinery and tin and iron ware. Pop., 1900, 12,407; 1905, 37,350, in which year the town was joined to Duisburg.

RUISDAEL, rois'dâl (often given as Ruysdael), Jacob (c.1628–82). The most eminent landscape painter of the Dutch school. He was born at Haarlem and studied under his uncle, Salomon Ruysdael (unlike whom, he signed his pictures Ruisdael); but he was more influenced by Cornelisz Vroom. In 1648 he was received into the guild at Haarlem, but about 1655 he removed to Amsterdam, obtaining the rights of citizenship there in 1659. Both at this time and earlier he traveled widely in his native land and in the outlying hill region of Germany, the Teutoburgerwald and the valleys of Mark and Berg; for these regions appear repeatedly in his pictures. His best work was done after 1660 and before 1675. Because of an advancing illness no longer able to make his own studies after nature, he imitated the popular Norwegian and Swiss pictures of Everdingen and others, striving after striking and grandiose effects. In 1681 he returned, poor and sick, to Haarlem, and his Mennonite coreligionists procured for him admission to the almshouse, where he died in March, 1682.

He was a close observer of nature, which he rendered in its various aspects with rare truthfulness, a powerful and warm coloring, and a mastery of execution ranging from the minutest touch to the broadest treatment. Selecting usually the flat and homely scenery of his native country, with lonely hamlets, water mills, dark sheets of water overshadowed by trees, while the sky is usually clouded, he imparts a somewhat melancholy character to his landscapes, which are tinged, however, with the poetic charm of repose in nature. Dark masses of foliage make the prevailing tone of his coloring a dark green. Unfortunately his earlier pictures have darkened so as to have lost much of their charm. He delighted also in depicting wide expanses of land or water, especially the surroundings of Haarlem or Amsterdam and the coast of Scheveningen. Of his marine views there are comparatively few. They are characterized by cloudy skies and an agitated sea and include some of his most successful efforts. Some of his greatest triumphs he won, however, with the representations of hilly and even mountainous scenery, with foaming waterfalls. By reason of this great versatility, which prompted him to depict every phase of nature, Ruisdael is justly considered the greatest of the Dutch landscape painters.

Among the best examples in public galleries are an "Oak Forest," "View of Haarlem," and an "Agitated Sea," in the Berlin Museum; "Ford in a Wood," "Castle of Bentheim," "The Hunt" (with accessories by Van de Velde), "The Monastery," and especially the "Jewish Cemetery," of sombre but imposing effect, in the Dresden Gallery, which possesses the largest number of his masterpieces. Admirable specimens of his waterfalls are in Munich, Brunswick, Cassel (1682), Amsterdam, The Hague, which also contains a fine view of the "Bleaching Green near Haarlem," in Antwerp, and in the National Gallery, London, where may also be seen a "Landscape with Ruins" (1673), and 13 others. A "Storm at Sea," a "Forest" (with cattle and figures by Berchem), and two landscapes, known as "Le buisson" and "Le coup de soleil," are in the Louvre. The Hermitage at St. Petersburg has a number of his works. Many examples were owned privately in England; but these have lately passed to America, where Ruisdael is well represented. In the Metropolitan Museum, New York, are four examples, including "Cottage under Trees" (Morgan collection), "Forest Stream," and "Wheatfields" (Altman collection). Important examples in private possession include: "The Sluice" (Mrs. John W. Simpson, New York), "Dunes near Haarlem" (W. A. Slater, Washington), "Winter Landscape" (Johnson collection, Philadelphia), "Forest Scene" (Widener collection, Philadelphia), "A Waterfall" (H. C. Frick, New York), "Mountain Torrent" (Mrs. Collis P. Huntington, New York), and "Woods" (W. A. Clark, New York). In his early period Ruisdael executed many spirited etchings.

Bibliography. The best accounts of Ruisdael's life and activity are in W. Bode, *Great Masters of Dutch and Flemish Painting* (New York, 1909), and Hofstede de Groot, *Catalogue of Dutch Painters*, vol. iv (London, 1912), with a complete catalogue of his work. Consult also: Würzbach, in Dohme, *Kunst und Künstler*, ii (Leipzig, 1878); Michel, *Jacob van Ruisdael et les paysagistes de l'école de Haarlem* (Paris, 1890).

RUIZ, rōō-ēth', Juan (c.1283–c.1350). A Spanish poet, more commonly known as the Archpriest of Hita. It is conjectured that he was kept in prison from 1337 to 1350 by order of the Archbishop of Toledo, Gil de Albornoz. What seems to be proved is that he was in jail

in 1343, when he finished his book, which, under the title of *Libro de buen amor*, is prefaced by a prose apologue urging the moral purpose of the work. The book involves a strange mixture of devotion, satire, humor, and bold attacks on the corruption of the Church and includes an unusual collection of fables, legends, and amorous stories. The Archpriest deserves the name that has been so often applied to him, the "Spanish Chaucer," and he exerted a widespread influence upon later writers. For the text of his work, consult Juan Ruiz, *Libro de buen amor* (diplomatic edition by Jean Ducamin, Toulouse, 1901), and the annotated edition by Julio Cejador y Frauca (2 vols., in the *Clásicos castellanos*, Madrid, 1913). Consult also James Fitzmaurice-Kelly, *Chapters on Spanish Literature* (London, 1908).

RUKWA, rū-kwä'. See RIKWA.

RULE, WILLIAM HARRIS (1802–90). An English Wesleyan Methodist clergyman, born at Penryn, Cornwall. Although largely self-educated, Rule became a linguist of ability. Entering the ministry in 1826, he was stationed for a year at Malta, was a missionary to St. Vincent in the West Indies (1827–30), and at Gibraltar (1832–42). From 1851 to 1857 Rule was editor of the *Wesleyan Methodist Magazine* and all other publications of the church. From 1857 to 1860 and from 1862 to 1864 he served as chaplain at the Aldershot Camp. Besides translating many works into Spanish, including the four Gospels, he wrote: *Memoir of a Mission to Gibraltar and Spain* (1844); *The Religious Aspect of the Civil War in China* (1853); *Savonarola* (1855); *Melanchthon* (1856); *Celebrated Jesuits* (2 vols., 1858); *Martyrs of the Reformation* (1862); *A History of the Inquisition* (1868; new ed., 2 vols., 1874); *Recollections of my Life* (1886).

RULE BRITANNIA. One of the national anthems of Great Britain. Its original appearance was in a mask entitled *Alfred*, the words by James Thomson and David Mallet, the music by Dr. Arne. It was first performed in 1740. The composer afterward changed the mask into an opera (1744). Beethoven wrote five variations on the theme of "Rule Britannia." In 1836 Wagner wrote an overture upon the theme. After having been lost many years the parts were discovered in 1904, and the work performed for the first time in 1905 in London.

RULED SURFACE. See SURFACE.

RULE NISI, nī'sī (Lat., unless). An order of a court obtained ex parte (q.v.), directing the opposite party to appear at a specified time and place and submit reasons and facts from which the court may find that the party applying for the order or rule is not entitled to the particular relief requested. The rule or order is generally so phrased that it commands the opposing party to show cause why such relief should not be granted, and, unless (nisi) cause is shown, the relief will be granted. The term is used in England, and the equivalent expression in general use in the United States is "order to show cause." See MOTION.

RULE OF FAITH (REG'ULA FIDE'I). One of several names given in the ancient Church to the statements of belief which constituted the standard of orthodoxy against prevalent errors and which were solemnly committed to catechumens at their baptism. See CREEDS AND CONFESSIONS, with the literature there cited; FAITH, RULE OF.

RULES OF THE ROAD. Regulations, formulated by custom and usage or, as is more frequently the case in modern times, by statute or city ordinance. While in a measure the fundamentals are alike, one set of such rules has been generally prescribed for travelers on land and another for those on water. The rules applicable both on land and water are that each traveler shall so control his vehicle or vessel as not to interfere unduly with the right of passage of another and that reasonable care and accommodation be used by him for the purpose of affording others their just and reasonable rights in the highway.

Land. Every driver is bound to exercise such reasonable skill and care as the circumstances of any situation demand to avoid not only other vehicles, but pedestrians as well, since the rights of the latter in the highway are equal to those of the vehicle, whether it be a wagon, an automobile, a motor bus, or a trolley car. Thus, such vehicles have no right of way over pedestrians, with the single exception that pedestrians must exercise greater care when crossing the tracks of a street railroad at places other than street intersections, and, correspondingly, the motorman of the street car is not bound to have his car under the same degree of control at such places. The general rule in case of travelers whose courses cross is that the one reaching the crossing first is entitled to pass, while the other must abate his pace or stop, as occasion requires. In the United States, when two vehicles meet in a highway, both must seasonably turn to the right of the centre of the highway to permit passage on the other side of the road without interruption, and, in the event that one vehicle overtakes another, it shall pass to the left of the overtaken vehicle, which, when request is made, must as soon as practicable turn to the right so as to allow passage to the overtaking carriage or motor car. In turning corners to the right vehicles must keep to the centre of the road, and in turning to the left they must pass to the right of the centre of the intersection of the two roads. Driving at excessive, unreasonable, or unlawful speed is always evidence of negligence; and, while there is some difference of opinion, the great weight of authority favors the rule that it is negligence to leave horses unhitched and unattended. Such negligence in the absence of contributory negligence on the part of the person injured will render the driver or owner of the horse liable to damages. At night all vehicles are required to have adequate lights, and in the case of automobiles and large vehicles of all sorts both head and tail lights must be shown. In England the rule prevails that vehicles going in opposite directions shall pass to the left when meeting, and that the overtaking vehicle shall bear to the right—in other words, the opposite rule to that in vogue in the United States. No one, however, may force his way ahead in the face of obvious danger, whether he has right of way or not, and such conduct will amount to contributory negligence precluding recovery in case of injury. In large cities it is customary to amplify these rules by minute and detailed traffic regulations so as to insure as high a degree of safety as is consistent with congested traffic. Thus, in the city of New York the Code of Ordinances provides, among many other things, that slow-moving vehicles must keep as

close as possible to the curb, no vehicle shall stop other than at the curb except in case of emergency, and, when overtaking a street car which has stopped to receive or discharge passengers, all vehicles must come to a full stop at least 8 feet from such car. Other rules are usually prescribed to regulate signals, lights, and rate of speed.

Water. The rules of the road for water craft are for the most part quite modern. Those relating to seagoing vessels were formulated, in their present shape, as the result of a maritime conference held in Washington during 1889. They were not entirely new, although they contained some important modifications of existing regulations. In England they are set forth in an Order in Council of Nov. 27, 1896, pursuant to an Act of Parliament. (57 and 58 Vict., c. 60.) In the United States they are embodied in several acts of Congress and a presidential proclamation. (Consult 28 Statutes at Large, 82, 672; 29 ib., 381, 885.) A set of international rules was agreed upon by all nations and went into effect July 1, 1897. (1 R. S. Sup. 781.) In the United States a separate set of rules has been enacted by Congress for the guidance of vessels along American coasts, in American harbors, and on waters connected therewith. (Consult 30 Statutes at Large, 96; 31 ib., 30.) Still another regulates navigation on the Great Lakes and their adjacent streams. (Consult 28 Statutes at Large, 645.) A fourth applies to vessels navigating the Mississippi River and its tributaries as well as the Red River of the North.

There are four classes of rules of the road at sea, concerning (*a*) lights, (*b*) fog signals, (*c*) steering and sailing, and (*d*) distress and other signals.

Lights. Steam vessels are required to carry a white light on the middle line, visible at a distance of 5 miles, a green light on the starboard (right) side and a red light on the port (left) side which are visible at a distance of 2 miles. Sailing vessels and vessels being towed must not carry the white (or masthead) light. A vessel which is not under control must carry two red lights, one over the other, in place of the white masthead light. In the daytime a vessel which is not under control must carry two balls or shapes, at least 2 feet in diameter, in place of the red lights. A steam vessel towing another carries two white lights in place of a single white light; if the tow is over 600 feet long, three white lights. Even small boats must be provided with a white lantern which they must exhibit when necessary. A vessel at anchor must carry a white light forward, which must be visible all around the horizon and not over 20 feet above the hull; if over 150 feet in length, she must also carry, at or near the stern and at a height of not more than 15 feet below the forward light, a white light visible all around the horizon. Other rules, varying somewhat from those above, have been formulated for vessels navigating in the inland waters of the United States, for small steam vessels, for pilot vessels, and others.

Fog Signals. In fog, mist, or falling snow steamers under way must, at intervals of not more than two minutes (once a minute in the case of vessels on inland waters), sound a blast of four to six seconds' duration. If the steamer should stop, she must sound two such blasts with an interval of about one second. A sailing vessel when under way must once every minute sound one blast on her fog horn when on the starboard tack, two blasts when on the port tack, and three blasts when the wind is abaft the beam. Vessels at anchor must, at intervals of not more than one minute, ring the bell rapidly for about five seconds.

Steering and Sailing Rules. Just as in the case of travelers on the highway, all vessels must be operated with reasonable care under existing circumstances and conditions.

When two steam vessels are approaching end on, each must alter her course to starboard (or incline to the right) so that each may pass on the port side of the other. Where two steam vessels are steering courses which cross, the vessel which has the other on her own starboard beam must keep out of the way of the other. In the international rules, when vessels are in sight of one another, a steam vessel which is taking any course authorized by the rules must indicate that course by the following signals: one short blast to indicate "I am directing my course to starboard," two short blasts to indicate "I am directing my course to port," and three short blasts to indicate "My engines are going full speed astern."

When a steam vessel is overtaking another, she must keep out of the way of the other: and in narrow channels every steam vessel must keep as near as possible to that side of the fairway which lies on the starboard side of such vessel. Where a steam vessel and a sailing vessel are proceeding on such courses as to involve risk of collision, the sailing vessel has the right of way.

In case two sailing vessels are approaching one another so as to involve risk of collision, the rules of right of way are: (*a*) a vessel which is running free shall keep out of the way of one which is close-hauled; (*b*) a vessel which is close-hauled on the port tack shall keep out of the way of one which is close-hauled on the starboard tack; (*c*) when both vessels are running free, with the wind on different sides, the vessel which has the wind on the port side shall keep out of the way of the other; (*d*) when both are running free, with the wind on the same side, the vessel to leeward has the right of way; (*e*) a vessel with the wind aft must give way to one which has the wind on some other bearing.

Distress Signals. When requiring assistance, the following signals should be given: In the daytime (i) a gun fired at intervals of about a minute; (ii) the international code signal NC (see Plate with article SIGNALS, MARINE); (iii) the distance signal, a square flag having a ball either above or below it; (iv) continuous sounding of fog-signal apparatus. At night (i) a gun fired at intervals of about a minute; (ii) flames on the vessel, as from a burning tar barrel; (iii) rockets, fired one at a time at short intervals; (iv) continuous sounding of fog apparatus.

Copies of the complete rules may be obtained free of charge at naval branch hydrographic offices and at small expense from dealers in nautical instruments. See SAFETY AT SEA.

Bibliography. Holt, *The Rule of the Road* (London, 1867); Thompson, *A Treatise on the Law of Highways* (Albany, 1891); *Mason on Highways* (ib., 1909); *Huddy on Automobiles* (ib., 1912); Cosby, *Code of Ordinances of the City of New York* (New York, 1916); Marsden, *A Treatise on the Law of Collisions at Sea*

(5th ed., London, 1904); Hughes, *Handbook of Admiralty Law* (St. Paul, 1901).

RULE OF THREE. See GOLDEN RULE; PROPORTION.

RULING MACHINE. A mechanical device by means of which parallel lines may be ruled on a surface at regular or definitely spaced intervals. The ruling machine employed by engravers is a form of dividing engine (q.v.) and is used in making tinted surfaces on blocks for printing. It consists of a tool that can be given a lateral motion by a screw or other device and a transverse or cutting motion as it is moved across the surface. The term "ruling machine" is also applied to a device used for ruling the lines in account and other blank books. This machine consists of a series of fountain pens or threads supplied with ink of the desired color, which press against the paper. See DIVIDING ENGINE.

RUL'LUS, PUBLIUS SERVILIUS. A Roman, tribune of the people in 64 B.C., proposer of a drastic agrarian law (q.v.). By this law a commission of 10 members was to be created, with power to buy land in Italy and to distribute that land among the poorer citizens. The money needed for the purchase was to be obtained by the sale of all property of the state in Italy and of land which since 88 B.C. had become public land in the provinces and from booty won in the future through war. The bill failed of passage. Three of Cicero's four speeches against the bill (*Orationes de Lege Agraria*) are extant.

RUM (abbrev. of *rumbullion* or *rumbooze*, the first word being perhaps an extended form of *rumble*, and the latter from *rum*, good, Gypsy *rom*, husband, *Rommani*, Gypsy, from *Hind. ḍom, ḍomrā*, from Skt. *ḍōmba*, name of a low caste + *booze, bouse*, from MDutch *būsen*, Ger. *bausen*, to guzzle). A spirit made by fermenting and distilling molasses and the refuse which accumulates in making cane sugar. The best rum is made from the pure molasses; a second grade is obtained from the skimmings and other wastes of sugar making. Fermentation is induced by the use of dunder; molasses is added, in the proportion of 6 to 100, and the fermentation allowed to continue to completion. When new, rum is white and transparent; its color is produced after distillation by adding caramel color. Rum is greatly improved by age and when very old has a high commercial value. The manufacture was at one time an important industry in New England, but has constantly decreased. The best rum is made in Jamaica. It owes its peculiar flavor to butyric ether, which fact is taken advantage of to produce an artificial rum. Consult Sadtler, *Organic Chemistry* (Philadelphia, 1900). See DISTILLED LIQUORS; LIQUORS.

RUMA'NIA. A kingdom of Europe, the most northeastern country of the Balkan states. It embraces the former principalities of Moldavia and Wallachia (united in 1861), the district called the Dobrudja, detached from Bulgaria in 1878, and 2969 square miles of territory ceded by Bulgaria by the Treaty of Bucharest (Aug. 7, 1913). The eastern Carpathians and their westward continuation, the Transylvanian Alps, are the western and northern barriers separating Rumania from Hungary. (See map accompanying BALKAN WAR.) The Danube marks the line between Rumania and Bulgaria on the south, except in the extreme east of the country, where there is an artificial boundary. The Black Sea bounds the country on the east for over 160 miles. In the extreme north an artificial frontier extends between Rumania and Russia, and the Pruth separates them on the east. In the extreme west the Kingdom touches Servia, the Danube forming the boundary. Area, 53,689 square miles, Rumania being the largest Balkan state (Map: BALKAN PENINSULA).

Topography. In the west the great walls of the Carpathians and the Transylvanian Alps rise to over 8000 feet in several places and slope down to the Rumanian plains in finely wooded declivities, divided by the valleys of many rivers. The Moldavian plain, occupying the eastern and extreme northern part of the country, descends to the south and is deeply trenched by many tributaries of the Danube, the principal being the Sereth. The Wallachian plain occupies the entire south, has a general southeasterly incline, and is traversed by the Aluta, Arjesh, Yalomitsa, and other affluents of the Danube. The Moldo-Wallachian plain is physically a part of the great plain of South Russia. In the southeast lies the steppelike plateau of the Dobrudja, which causes the Danube to turn to the north. The coast of the Dobrudja, however, is low. This plateau and southeastern Wallachia are mainly pastoral steppes; the rest of the plain is very fertile. The Danube is the great highway of the Kingdom. Before it reaches the delta it divides into many branches and courses over a flat, marshy, alluvial plain, rather difficult of access.

Climate, Flora, and Fauna. Though in the same latitude as north Italy, the land has far greater climatic extremes because of its greater distance from the oceanic influences. Its bitterly cold winters are due to its being exposed to the winds from the Russian steppes; the winds from the Mediterranean subject it to subtropical summer heat. The mercury sometimes rises to above 100° F. in the shade and at times sinks below —20° F. The Danube is usually icebound about three months. The annual rainfall ranges from 15 to 20 inches and is unequally distributed, being heaviest in June. The soils, particularly the black earth of the plains, make Rumania one of the most fertile countries of Europe.

Three zones of vegetation are distinguished—the high alpine zone in the mountains, the forest zone of the lower mountain slopes and foothills, and the steppe zone of the prairie regions. The mountains are clothed with pines, larches, firs, dwarf junipers, and birches. Firs are the prevailing trees among the foothills. Varieties of oak grow on the plains, beeches, chestnuts, and maples being also planted. The black alder grows on the marshes. The mountains present great stretches of woodlands, but large forest tracts are now rarely met on the plains and a great part of the Dobrudja is treeless. The forests have an aggregate area of 6,935,120 acres. The fauna resembles that of Russia (q.v.).

Geology and Mineral Resources. The Carpathians and the Transylvanian Alps consist mainly of crystalline schists with extensive intrusions of Jurassic and chalk beds. Earthquakes, originating among the mountains, seem to show that the process of mountain formation is still in progress. The two great low plains are covered with the black loess of South Russia, with large admixtures of pebbles and clay, outwashed from the hills, in the southern plain of Wallachia. This region is traversed by Eocene formations, and by strongly folded Miocene strata, which often contain salt and petroleum.

The plain of Moldavia, on the other hand, consists of late Tertiary formations. The mineral wealth is very great. Gold, silver, iron, lead, quicksilver, copper, manganese, coal, building materials, petroleum, and salt are all found, but only the last three are worked to any great extent. Gold, in particles and scales, is found in some of the rivers. Marble of excellent quality and clays and sands suitable for porcelain and glass wares are abundant. The salt deposits cover an enormous area in Moldavia and Wallachia, and as many of the beds have a thickness of 750 feet or more, Rumania could supply Europe for centuries. The oil-bearing region is very extensive and is exploited to a large extent by foreign capitalists. The American Standard Oil Company and the German Disconto-Gesellschaft have established large refineries near Ployeshti. The product of petroleum in 1913 was 1,885,384 metric tons.

Agriculture. Rumania is one of the principal wheat and corn producing countries of Europe. About three-fifths of the population are dependent on agriculture. Modern farm machinery has been introduced on the large estates, but for the most part agricultural methods and implements are still antiquated. In 1905 the productive area of the country was about 9,974,000 hectares, or about 76 per cent of the total area. Of the productive area 60.2 per cent (6,001,000 hectares) was arable land, 15.1 per cent untilled meadowland and pastures, 11.1 per cent tree and shrub crops, 28 per cent woods and forests. Of the arable land 83.9 per cent (5,037,000 hectares) was under cereals, this percentage of cereal land being higher than that of any country in the world except Russia, Servia, and the Union of South Africa. The average production in the five-year periods 1905–09 and 1910–14, in metric quintals, together with the area in 1914, in hectares, are shown for principal crops in the following table:

PRODUCT	Average production for five-year periods		Area in
	1905–09	1910–14	1914
	*Metric quintals**		*Hectares†*
Wheat	20,370,393	23,208,675	2,101,727
Corn	21,513,747	29,061,885	2,065,566
Rye	1,257,256	1,129,922	84,073
Barley	5,013,786	5,614,881	568,422
Oats	3,214,001	4,141,817	427,500
Sugar beets	1,785,709	2,741,507	14,785
Tobacco	56,670	78,926	10,955
Vines‡	1,608,372	1,295,260	87,983

* Metric quintal = 2204 pounds. † Hectare = 2.47 acres.
‡ Production in hectoliters.

The culture and sale of tobacco are a government monopoly. Fruits are raised to a considerable extent, especially plums, which, in the form of prunes, are a valuable export.

Stock raising, which is carried on with little skill or method, has been somewhat retarded by the closing of the Austro-Hungarian frontier to the export of live animals. According to the census of 1900 and the estimate of 1911, horses numbered 864,324 and 824,714 respectively; mules and asses, 7701 and 4248; cattle (including buffaloes, which numbered 43,475 in 1900), 2,588,526 and 2,666,945; sheep, 5,653,444 and 5,269,493; goats, 232,515 and 186,515; swine, 1,709,205 and 1,021,465.

Manufactures and Commerce. The house industries supply the peasants with most of their personal needs. Foreign capital is being attracted and industrial development is making considerable progress. Several hundreds of flouring mills turn much of the wheat into flour, which is exported even to England. In 1900 imports and exports were valued at 216,985,878 and 280,000,341 lei (francs) respectively; in 1910, 409,715,576 and 616,504,872; in 1912, 637,905,560 and 642,103,783. Imports and exports for 1910 and 1912 are classified as follows (values in thousands of lei):

CLASS	Imports		Exports	
	1910	1912	1910	1912
1. Animals and animal products	83,397	123,236	17,767	24,453
2. Vegetable products	144,441	213,502	553,828	544,207
3. Mineral products	112,512	175,981	43,399	71,504
4. Products combined of 1, 2, and 3	69,365	125,183	1,510	1,940
Total	409,716	637,902	616,505	642,104

In 1912 the export of wheat amounted to 1,371,639 metric tons, valued at 256,496,420 lei. The export of corn in 1912 amounted to 1,085,048 metric tons, valued at 146,698,513 lei. The value of the barley exported in 1912 was 37,163,366 lei; oats, 29,032,418; rye, 9,388,765. Of the total import value in 1912 Germany was credited with 37.69 per cent, Austria-Hungary 21.77, the United Kingdom 13.80, and France 6.12. Of the export value in 1912 the share of Belgium was 23.82 per cent, Italy, 18.85, Austria-Hungary 14.76, Netherlands 8.13, France 7.78, the United Kingdom 6.70, and Germany 6.62. Imports from the United States in 1912 were valued at 12,873,949 lei (2.02 per cent) and exports thereto at 1,061,735 lei (0.17 per cent). Imports and exports by countries (in thousands of lei):

COUNTRY	Imports		Exports	
	1910	1912	1910	1912
Germany	138,237	240,435	24,281	42,536
Austria-Hungary	97,980	138,874	37,284	94,750
United Kingdom	56,776	88,000	33,505	43,041
France	25,627	39,063	46,875	49,945
Italy	21,744	37,075	68,672	121,066
Belgium	13,983	20,150	226,242	152,999
Turkey	13,851	14,827	18,600	25,869
United States	3,630	12,874	259	1,062
Switzerland	8,452	10,875	113	56
Netherlands	5,818	5,506	99,111	52,180
Total incl. other	409,716	637,906	616,505	642,104

Transportation and Communication. The only important ports directly on the Black Sea are Sulina and Constantsa (Küstenje). Far more important are the large commercial cities of Galatz and Brăila, at the head of deep-water navigation on the Danube. Brăila is the great wheat-exporting port of the country. In 1912 there were entered at the ports 36,968 vessels, of 10,807,213 tons, and cleared 36,730 vessels, of 10,740,172 tons; marine navigation amounted to 2360 vessels, of 2,885,672 tons, entered, and 2352 vessels, of 2,844,973 tons, cleared, the remainder being fluvial. Shipping entered with cargo

amounted to 3,915,852 tons (2,594,562 fluvial, 1,321,290 marine); cleared with cargo, 4,837,504 tons (2,771,882 fluvial, 2,065,622 marine). The merchant marine at the end of 1912 consisted of 649 vessels, of 198,159 tons (of which 117, of 30,762 tons, steam). A large number of steamboats and sailing vessels ply the Danube, and much timber and grain is transported to the Danube by steamer, barge, or raft on the Sereth and the Pruth. In 1913 the length of railway in operation was 2338 miles, of which 2205 were owned by the state.

Government and Finance. Rumania is an hereditary constitutional monarchy. The present constitution, enacted by a constituent assembly elected by the people in 1866, was amended in 1879 and again in 1884. According to its provisions the executive department is vested in the King, who has power of suspensive veto, and a cabinet of nine members. The Legislature is composed of a Senate and a Chamber of Deputies, the members of both of which are chosen (in part indirectly) by electoral colleges made up of all taxable citizens classified according to the amount of taxes paid, property owned, or educational qualifications. The Senate has 120 members, elected for 8 years. The heir apparent, 8 bishops, and 2 representatives selected by the universities of Bucharest and Jassy are members of the Senate. The Chamber of Deputies has 183 members, chosen for 4 years. Senators must be 40 years of age and have an annual income of 9400 lei. Deputies must be 25 years of age. The Code Napoléon is the basis of the legal system. For its local government Rumania is divided into 32 departments, exclusive of the territory annexed from Bulgaria in 1913. The capital is Bucharest.

The revenues are derived from direct and indirect taxes, monopolies of tobacco, salt, matches, playing cards, cigarette paper, and gunpowder, and from the state railways, domains, etc. For the year 1913–14 the budget balanced at 600,232,900 lei. The public debt amounted on Oct. 1, 1913, to 1,769,197,574 lei. A large part of it was contracted for public works, mainly railways. The foremost financial institution is the National Bank of Rumania, at Bucharest, with branches in the important towns. At the end of 1914 it had a circulation of notes and cash bonds amounting to 578,243,647 lei.

Money, Weights, and Measures. The gold standard was introduced in 1888. The monetary unit is the leu (pl. lei), par value 1 franc, or 19.295 cents. Principal coins in circulation, the silver 7½ lei, 5 lei, 2 lei, 1 leu, and subsidiary nickel and copper pieces. Gold is coined in 20, 10, and 5 lei pieces. The metric system of weights and measures is legalized, but Turkish denominations are used to some extent.

Population. The census of December, 1899, returned a population of 5,956,690; that of Dec. 19, 1912, 7,234,919; 1920, 17,393,149. The population of the territory annexed in 1913 was reported at 273,090. The larger cities, with 1912 population, are: Bucharest, 341,321; Jassy, 75,229; Galatz, 71,641; Brăila, 65,052; Ployeshti, 56,460; Craiova, 51,404; Botoshani, 32,574; Buzău, 28,807; Constantsa, 27,201; Bârlad, 25,288.

Army. Service is universal and compulsory, periods of liability in the active army and several reserves being quite similar to those observed among the Russian Cossack troops of southeast Europe. The conditions of service are as follows: two years training at home, from 19 to 21; service with the colors in the first line or active army, 2 years in the infantry, 3 for the other arms; first reserve, 5 or 4 years; second reserve, 10 years; territorial army or third reserve, 4 years; total liability, 21 years, ending at the age of 42. There is also a supplementary reserve made up of those exempt from service with the colors and the surplus above the annual contingent.

Organization.—The field army consists of 5 army corps and 2 cavalry divisions; the corps of 3 divisions, one being a reserve division. A brigade (2 regiments) of cavalry is attached to each corps. A division consists of 2 brigades, each 2 regiments of 3 battalions and a battalion of chasseurs, 1 artillery brigade of 2 regiments (12 batteries), 3 howitzer batteries, 3 squadrons of cavalry, and a company of engineers. A cavalry division consists of 2 brigades of 2 regiments (24 squadrons) and 2 batteries of horse artillery. There are altogether 40 infantry regiments (3 battalions each), 9 rifle battalions, 20 cavalry regiments, 20 regiments of field artillery, each of 6 batteries, 5 howitzer divisions, 3 horse artillery batteries, 22 companies of fortress artillery, 7 engineer battalions, and a railway battalion. Batteries have 4 guns each.

The peace strength of the Rumanian army is about 5800 officers, 125,000 men, 29,000 horses, 800 guns, and 60 machine guns.

Upon initial mobilization for war the 5 army corps and 2 cavalry divisions should amount to about 290,000 men. This includes the reserve for the first line and the organized troops of the second line, consisting of 40 battalions of infantry and 9 batteries of artillery. The last reserve, or territorial army, must be added to the initial mobilization of about 290,000 to obtain the ultimate total war strength of trained and untrained men. The exact numbers are not known, but the estimated total is at least 500,000 men.

Arms.—Infantry, Mannlicher magazine rifle, calibre .256; cavalry, Mannlicher carbine; field artillery, Krupp quick-firing 75-millimeter gun.

Budget for 1913–14, $19,622,500.

Religion and Education. Orthodox Greek is the state religion, but all confessions enjoy full freedom. The state church is independent of all "alien prelates," and the Metropolitan Primate is appointed by the legislative bodies and confirmed by the King. In 1899 there were 5,451,787 members of the Rumanian church, 149,687 Roman Catholics, 22,749 Protestants, 266,652 Jews, and 44,732 Mohammedans. The percentage of illiterates is very high; in 1909, 60.16 per cent of the population over seven years of age could not read or write. Though education is free and compulsory many of the village communes are without schools. There are two universities—one at Bucharest, with about 120 professors and about 3500 students, and one at Jassy, with about 60 professors and over 500 students.

Ethnology. Only about half of the Rumanians inhabit the modern Kingdom of Rumania. The remainder are found in the neighboring regions of eastern Hungary (mainly Transylvania), Bukowina, Bessarabia, Servia, and Bulgaria, besides scattered groups in other parts of the Balkan Peninsula. The most important of the detached Rumanian communities is that inhabiting the Mount Pindus districts. These are called Tsintsars or Kutzo-Vlachs by their Macedonian neighbors, but their true name is Ara-

mâni or Armâni, i.e., Romans. The popular belief and claim of the Rumanians is that they are the direct descendants of the Roman colonists sent into the conquered Province of Dacia (the modern Rumania) by the Emperor Trajan. This theory has been severely attacked by Rösler, Hunfalvy, and others, and seems questionable both on historical and linguistic grounds. The Emperor Aurelian (270–275) withdrew the Roman colonists from Dacia to the south side of the Danube, and from that time until the thirteenth century Dacia was given over to the barbarian hordes who swept over the country repeatedly. During this time the Roman language and culture seem to have disappeared, and the former was first reëstablished in its modern form in connection with a northern movement of the Rumanians from the regions south of the Danube. This would seem to support the view that the final area of dispersion was to the south, and possibly in the neighborhood of the Pindus region. Here would also be the seat of the development of the language. Numerous linguistic characteristics seem to support this view.

The study of the head form of the modern Rumanians shows dolichocephaly in the east, the breadth of the head increasing to brachycephaly in the west. This eastern dolichocephaly along the Black Sea is regarded by many as a survival from a primitive long-headed race which formerly occupied almost all eastern Europe before the Slavic invasions. If this be true it shows a continuance of race in spite of invasions. It is also noteworthy that in physical type the Rumanians differ but slightly from the Bulgarians, which would seem to show that the mass of the people have been but slightly affected by their conquerors. The Rumanians may then be regarded as a mixture, varying in different regions, of this primitive population with Roman colonists and Teutonic, Slavic, and Mongol invaders.

History. The modern kingdom of Rumania, which dates in its present political organization only from 1881, was formed by the union of the two kindred principalities of Moldavia and Wallachia (qq.v.). These countries form the greater part of the large area conquered by the Emperor Trajan (101–106 A.D.) and made the Roman Province of Dacia (q.v.). During the reign of Alexander Severus the province began to suffer from the inroads of the Goths, and in the reign of Aurelian (c.271) it was finally abandoned to these Germanic invaders, and the Roman colonists crossed the Danube into Mœsia and Dardania. But while Dacia thus abandoned fell a prey to the Huns, Avars, Gepidæ, Slavs, Bulgars, Petchenegs, Cumans, and other barbarians, in Mœsia and Dalmatia the Roman colonists preserved their Latin speech and imposed it on the Thraco-Illyrian population of the northwestern Balkan Peninsula. Owing to their nomadic and predatory dispositions these Vlachs, as they are called by the Greek writers, were a constant source of annoyance to the Byzantine emperors. Having risen in revolt in 1186, the Vlachs, after repeatedly defeating Emperor Isaac II Angelos, founded with the Bulgarians an empire dreaded by Greeks and Crusaders alike. It lost its importance, however, in the second half of the thirteenth century. See BULGARIA, *History*.

The Vlachs's occupation of the land north of the Danube along both slopes of the Transylvanian Alps is thought to have taken place during the first part of the twelfth century and possibly earlier. In Hungarian documents of the thirteenth century they appear, under the names of Blaci, Olahi, or Walachi, as an agricultural and pastoral population enjoying certain privileges and local autonomy. They owed allegiance to the King of Hungary. Under circumstances which are little known some of these voivodes (princes) succeeded in founding, during the late thirteenth and the fourteenth centuries, the autonomous Rumanian principalities of Wallachia and Moldavia, which grew rapidly towards south and east until the former reached the lower Danube and the latter the river Dniester. Unfortunately the countries soon had to face the tide of Turkish invasion which after the middle of the fourteenth century swept over southeastern Europe. At the same time they had to contend against the kings of Hungary and Moldavia, also against Poland. By the beginning of the fifteenth century Wallachia had become a vassal state of the Ottoman Empire, being forced to pay regular tribute; Moldavia held out a century longer. It was long, however, before the Turks succeeded in subjecting the principalities to their sway, and more than once they suffered defeat at the hands of the Ruman voivodes or princes. Moreover, the Turks never effected a permanent settlement in the principalities. The rule of the voivodes of Wallachia and Moldavia presents a dismal and bloody record, vigor and ability on the part of the princes going hand in hand with savagery. For a moment, at the close of the sixteenth century, the Wallach, or Ruman, nationality was brought under the sway of a single monarch, Michael the Brave of Wallachia, who brought Moldavia and Transylvania under his sceptre. Michael was assassinated in 1601 and this great Rumania vanished, to be revived in the dreams of the Rumanian patriots of to-day.

In the seventeenth century the hold of Turkey upon the principalities was gradually tightened and at last their independence was practically extinguished. The Rumanian soil, however, was not opened to the Turks for settlement. In 1710 the voivodes sought to free their states from the Turkish yoke with the assistance of Peter the Great. (See KANTEMIR.) The Czar was hemmed in by the Turks on the River Pruth (1711) and escaped only by agreeing to a humiliating peace. After this the Porte ruled Moldavia and Wallachia through hospodars or governors taken from among the Greek Fanariot families. (See FANARIOTS.) Many of the families of the boyars or nobles became allied with the Fanariot houses and Greek became the official language. Again and again the armies of Russia, in her wars with Turkey, traversed and occupied the unhappy provinces. Bukowina, in 1777, and Bessarabia, in 1812, were severed from Moldavia and annexed to Austria and Russia respectively. The outbreak of the Greek struggle for independence, the first episode of which was enacted at Jassy in 1821 (see YPSILANTI, ALEXANDER), put an end to the Fanariot rule in the two Danubian principalities and boyars were allowed to choose the hospodars from natives.

The Rumanian language took its place again and, under the stimulus of the teaching of the history of the people, promoted especially by four Rumanian historians, Sincai, Maior, Asachi, and Lazar, a spirit of nationality was developed which looked to independence and gave a new unity to the ideas and purposes of the two states.

In the Treaty of Adrianople of 1829 Turkey

was forced to accord to Russia a protectorate over the Danubian principalities. The hospodars, among whom were some strenuous and enlightened rulers of the family of Ghika (q.v.), were reduced almost to the position of lieutenants of the Czar. But the schemes of Russia aroused patriotic opposition, and the unsuccessful issue of the war waged against Turkey and her western allies (1853–56) deprived Russia of her hold on the Danubian principalities.

The Congress of Paris in 1856 recognized the need of a modification of the relations of the Porte to the principalities, but would not concede complete independence. They were organized as the United Principalities of Moldavia and Wallachia, each having its own hospodar and government, but with a common commission of 16 members and a general court of justice. In 1859 both elected the same hospodar, a boyar of Moldavia, Prince Cuza, and in 1861 he was proclaimed Prince of Rumania under the name of Alexander John I (q.v.). The Sultan recognized the new adjustment and the long-desired union was accomplished. Prince Alexander was deposed in 1866 because of his arbitrary government and Prince Charles of Hohenzollern was elected as hereditary Prince under a modern constitution, it being found impossible to reach an agreement on any member of the native nobility. An efficient army was organized by Prince Charles on the Prussian model, and when war broke out between Russia and Turkey in April, 1877, Rumania entered into alliance with Russia, giving the armies of the latter free passage through Rumanian territory. On May 21 the Rumanian Parliament declared the country independent. The Rumanian army joined the Russians in the field, and in the operations at Plevna the forces of the principality bore an important and wholly creditable part. (See Russo-Turkish War.) The Berlin Congress in 1878 recognized the independence of Rumania, but in spite of the protest of the Rumanian envoys restored to Russia the strip of Bessarabia, touching the Pruth and the Danube, which had been annexed to Moldavia in 1856. Rumania, however, received the Dobrudja. It was further stipulated that difference of religious profession should not disqualify from the exercise of full civil and political rights in Rumania. The last stipulation introduced the Semitic question into the politics of the new state by bringing a quarter of a million Jews into citizenship, a condition which has never been acquiesced in by the Christians, who have continued to persecute the downtrodden race, many of whom have emigrated to the United States. In 1881 the government declared Rumania a kingdom and this was accepted by the Powers. In 1905 the grant of special privileges to the Rumanians in Macedonia by the Sultan led to strained relations between Rumania and Greece. Diplomatic communications were severed, and in 1906 many prominent Greek residents in Rumania were expelled.

In 1907 a momentous outbreak took place among the peasants which at one time seriously threatened the social order. Rumania is essentially an agricultural country and much of the land is in the hands of large proprietors who generally sublet it to Jews. Great complaints were made by the tenants against the extortion practiced on them. The insurrection spread rapidly and martial law was declared by the government; it took an army of 150,000 men to suppress it. M. Sturdza became Prime Minister, resolved to effect reforms in the interests of the peasants. Land taxes, particularly those affecting the tenants, were decreased, lands were forbidden to be leased to middlemen, government loans of money were made to needy peasants, and many other agrarian reforms were effected. A by-product of this insurrection was the anti-Semitic movement. See Jews.

During the first Balkan War in 1912 against Turkey, Rumania remained a spectator, but joined Servia and Greece in the second Balkan War against Bulgaria to despoil the latter of her conquests. As a result Rumania got from Bulgaria the Dobrudja region north and east of a line drawn from Turtukai to Baltchik. The reorganization of this new region as well as the expenses of the war necessitated a loan of 300,000,000 francs, made in Germany.

Fear of Bulgarian revenge caused Rumania, Servia, and Greece to draw more closely together. Rumania was now recognized as the leading Balkan Power, and the Czar of Russia paid a visit to King Charles. This caused great apprehension in Austria, because about 3,000,000 Rumanians live under the Hapsburg rule. Powerful fortifications were erected by the Rumanian government and the nucleus of a navy was also built on the Black Sea. On Oct. 10, 1914, King Charles died and was succeeded by the Crown Prince Ferdinand. At the outbreak of the Great War in 1914, Rumania announced a policy of strict neutrality. During the Teutonic drive into the Balkan Peninsula (1915), the neutral attitude was maintained, although Rumania seemed to favor the Entente allies, particularly Russia. See Balkan War; War in Europe.

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RUMA'NIAN LANGUAGE. The Rumanian language is spoken by some 12,000,000 people inhabiting Rumania (7,000,000), Austria-Hungary (3,700,000), Russia (1,300,000), the Timok region of Servia (some 200,000), and Macedonia, Albania, and Greece (300,000?).

The Rumanian is one of the Romance (q.v.) languages and particularly related to the Italian and the extinct Dalmatian. Thus, in Rumanian as in Italian the final *s* of the Latin is dropped, as Rum. *oameni, zici, doamne*, from Lat. *homines, dicis, dominas;* It. *uomini, dici, donne;* both Rumanian and Italian use the dative singular pronoun of the third person, *lui;* both preserve the plural in *-ora*, as in Rum. *focuri*, fires, It. dialectical *focora*, etc. The Rumanian is divided into four main dialects: (1) North or Daco-Rumanian (Rumanian proper), spoken in Rumania and the neighboring countries; (2) the South or Macedonian Rumanian (or Vlach; also called Aromunian, i.e., Rumanian), spoken in Macedonia, Thessaly, Epirus, and Albania; (3) the Meglen dialect, northwest of Salonica; and (4) the Istrian or Dalmatian Rumanian, spoken by less than 3000. The difference between these dialects is so great that mutual understanding is excluded. Within the Daco-Rumanian there are numerous subdialects. The literary Rumanian is based on that Wallachian form of speech in which the labials of Latin origin have not been altered before *ie* and *i* (as Rum. *piept, bine, fire, vin, miere*, from Lat. *pectus, bene, fieri, vinum, mel(is)*). Among the phonetic peculiarities of the Rumanian may be noted the preservation of accented Latin *ŏ, ŭ* as *o, u* (as Rum. *loc, dulce*, from Lat. *lŏcus, dŭlcis;* It. *luogo, dolce*); the loss of intervocalic *b* and *v* and change of intervocalic single *l* to *r* (as Rum. *cal*, It. *cavallo*, horse; Rum. *miere*, honey, It. *mele*); the permutation of accented *e, o* with *ea, oa* under certain circumstances (as Rum. *frumos*, beautiful, Sp. *hermoso;* fem. *frumoasă*, from the popular Latin *formosus, -a;* Rum. *viteaz*, hero, pl. *viteji*, from the Slavic *vitęzĭ*); the occurrence of the sounds *ă(ĕ)* and *â(î)*; etc. The Rumanian vocabulary contains, in addition to Latin elements, numerous borrowings from the Slavic, Greek, Albanian, and Turkish, without counting the more recent additions from almost all the languages of Europe. The influence of the South Slavic (Church Slavic, Bulgarian, and Servian), Middle Greek, and Albanian is not confined to the vocabulary, but has profoundly modified the essentially Latin structure of the language. The Rumanian thus agrees with the Albanian and Bulgarian in having a postpositive article, which in Rumanian receives the case endings; Rum. *om*, a man, *omul*, the man, *omului*, of, to the man, *oameni*, men, *oamenii*, the men, *oamenilor*, of, to the men; *floare*, flower, *floarea*, the flower, *floarei*, of the flower, *flori*, flowers, *florile*, the flowers, *florilor*, of, to the flowers. The Rumanian, Albanian, and Slavic form the numbers from 11 to 19 by means of the preposition "on," Rum. *spre: unsprezece*, eleven, i.e., one on ten; etc. Both Rumanian and Slavic have a feminine vocative in *-o;* and the Rumanian, Bulgarian, Servian, Albanian, and Greek form a future with the auxiliary "to will" (as Rum. *voi scrie, va(o) să scriu*, Gk. *θὰ γράφω*, Bulg. dialectal *šte pišŭ*), etc. These and numerous other coincidences and the evidence of the vocabulary unmistakably point to the Balkan Peninsula as the cradle of the Rumanian language. (See Rumania, *History.*) In writing the Rumanians formerly used the Cyrillic alphabet of the Slavs, but replaced it in the nineteenth century with the Latin. The spelling is now nearly phonetic; *c* and *g* before *e* and *i* are pronounced as in Italian, *ş* has the value of *sh*, *ţ* = *ts*.

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German, such as those of Gartner (1903), Weigand (1903), and Tiktin (1905); in French, by Lovera (1912) and Candrea (Hecht), *Cours complet de grammaire roumaine* (Paris, 1900), containing the morphology only.

RUMANIAN LITERATURE. I. Old (Slavic and Greek) Period (to 1830). Until the end of the eighteenth century the literature of Rumania was chiefly subjected to Byzantine, South Slavic, Neo-Hellenic and, to a somewhat lesser extent, Russian and Polish influences. Transylvania alone was directly in touch with the west of Europe. The earliest literature was in the Old Church Slavic and consisted almost entirely of ecclesiastical books and a few chronicles. All legal, judicial, and administrative documents were drawn in the Old Church Slavic, which was also the official language of the Rumanian church until the beginning of the eighteenth century (not 1634 as is frequently affirmed). The use of the Rumanian language does not go back of the sixteenth century. The earliest extant printed books in Rumanian—a Gospel of 1560, the Acts of 1563, a Psalter of 1568, etc.—appeared at Kronstadt (Brasov) in Transylvania and consisted of translations made or edited by one Coresi, a Wallachian, in the interest of Lutheran and Calvinistic propaganda. A new effort of the Protestants in 1633 called forth a vigorous Greek orthodox opposition. The Rumanian princes Matei Basarab and Vasile Lupul, assisted by the famous Metropolitan of Kiev, Movila, who was of Rumanian origin, established several printing presses, from which were issued Church Slavic and Rumanian works of religious controversy and edification. The first complete Bible was printed at Bucharest in 1688; this translation is remarkable for the purity and dignity of its language, and more than any other book led to the establishing of a standard literary language. To the same epoch belongs one of the greatest figures in ecclesiastical literature, the Moldavian Metropolitan Dosoftei (Dositheus), author of voluminous *Lives of Saints* (1682–86) and of the first Rumanian verses, in the guise of a Psalter (1673). The cultivation of ecclesiastical literature continued during the succeeding centuries.

More original and interesting than the Church books are the historical productions of the period. The best historians lived in Moldavia and have left an uninterrupted narrative of the events between 1359 and 1774. The best are Ureche, Miron Costin and his son Nicolae, Neculcea, and Prince Demeter Kantemir (1673–1723), who, in addition to works in Latin, Rumanian, and Russian on Rumanian history and other subjects, wrote in Latin a famous *History of the Ottoman Empire* (Eng. trans., London, 1734–35, etc.). Miron Costin also celebrated his country and nation in Polish verse. Several of these historians laid great stress on the Latin origin of the Rumanian language and their nation's Roman descent. The annalists of Wallachia had less talent and learning than the Moldavians, but their activity lasted well into the nineteenth century.

The advent into the principalities of numerous Greeks—clergymen, political agents, merchants, noblemen, office and even throne seekers—made a profound impression on Rumanian society in the seventeenth century. Greek influence became still stronger in the eighteenth, when the princes were exclusively recruited from among the Greeks. Greek schools and letters found in Rumania another Hellas and introduced the rudiments of Humanism into Rumanian society. Through the Greek and by means of translations from the Greek the Rumanians became acquainted with classical Hellenism, the Middle Greek romances and Neo-Hellenic lyrics, and indirectly with the literature of western Europe. About the same time began the influence of Russian, and a little later French ideas and letters. Typical representatives of the combined Greek, Russian, and French influence were the lyricists Ienache Văcărescu (1740–99), Costache Conachi (1777–1849), and Iancu Văcărescu, who lived into the next period (1792–1863), all members of the aristocracy. The soldier Vasile Cârlova (1809–31), a greater poet by far, belongs by his style and ideas to the next period of the Rumanian literature.

A place apart is held by the writers of Transylvania. There a large body of Rumanians had been united to the Church of Rome (1697–1700). A number of their priests who had received an excellent classical education conceived an ardent admiration of Rome and wrote historical and linguistic works in Latin and Rumanian, in which they upheld the Latin origin of their race and native tongue. Thus arose G. Sincai's (1753–1816) monumental *Cronica Românilor*, a history of the Rumanians and the neighboring nations, P. Maior's *Istoria pentru începutul Românilor* (*History of Rumanian Origins*, 1812), and the *Lexicon* of Buda (1825). This literary movement is known as the Latinist, owing to its interest in Latin Rome and its efforts to eradicate the traces of all non-Latin influences in Rumanian language and culture. Transylvania produced, however, a few writers of a more popular character. Thus, one Joan Deleanu wrote a mock-heroic poem, *Țiganiada*, directed against the Gypsies; Vasile Aaron (1770–1822) wrote a poem in 10 cantos on the Lord's Passion (1805), a satire upon drunkards, and romances like *Narcissus and Echo;* and Joan Barac an epic, *Arghir și Elena* (1801), which was meant to symbolize somehow Trajan's conquest of Transylvania.

II. Modern (National) Period (1830–). The Latinist movement crossed the Carpathian Mountains with Gheorghe Lazăr (1779–1823) and others and made disciples in the Rumanian principalities. Chief among them were the educators G. Asachi (1788–1871) in Moldavia and the brilliant Joan Heliade-Radulescu (q.v.) (1802–72) in Wallachia. Combined with French and Italian influence the Latinist movement did much good. Thus, Radulescu, who was not an extreme Latinist, at first wrote a good Rumanian, freed the language from the Cyrillic alphabet, translated numerous masterpieces of the classical literature and western Europe, and did much to strengthen the national consciousness. The philologist T. Cipariu (1805–87), A. T. Laurianu (1810–81), and the historian A. Papiu Ilarian (1828–77) produced meritorious works. On the other hand, the Latinists often distorted historical truth when it conflicted with their views, and were led by their exaggerated reverence for the Roman past to disparage the language of the people, which they proposed to replace by various jargons of their own making, patterned after the classical Latin. The only poetic production of the Latinist school still remembered is a patriotic poem written by Andrei Mureșanu (died, 1863), "Awake, Rumanian, from thy lethargic sleep!"

In agreeable contrast to the pedantic Latinists was a writer for the people, Anton Pann (1794–1854), a Bulgarian by birth, who assimilated and published, with additions of his own in popular strain, a vast collection of the lore elaborated by the Rumanian peasantry in the course of centuries. The more ambitious writers of the period, however, aimed to create a literature comparable with that of western Europe. Most of them combined the intellectual tendencies derived from French literature with the nationalism characteristic of the middle class of society. While the earlier literary productions were to a large extent artificial and bombastic, a critical and realistic movement, the tenets of which were formulated in the sixties by Titu Maiorescu and Jacob Negruzzi, soon bore fruit and contributed to the defeat of the Latinist tendencies. The best writers of what may be called the classical period of Rumanian literature include, besides the two writers just mentioned, the poets Grigore Alexandrescu (1812–85), author of patriotic odes, satires, and fables; D. Bolintineanu (1819–72), popular for his historical ballads, but happier in his Oriental poems; the elegiasts A. Sihleanu (1834–57) and G. Crețeanu (1829–87); and two poets who, by sounding the social note, marked the transition to the modern school, N. Nicoleanu (1833–71) and Al. Depărățeanu (1835–65). Among the prose writers the greatest names are Nicolae Bălcescu (1819–52), a historian; Alexandru Odobescu (1834–95), a historical novelist and author of an admirable medley on topics related to hunting, *Pseudokynegeticos;* M. Kogălniceanu (1817–91), the greatest orator; Joan Ghica (1816–97), who left masterful portrayals of old Rumanian society; the writer of historical tales, Konstantin Negruzzi (q.v.) (1806–68), who also translated from Pushkin and Victor Hugo; and the versatile Bogdan Petriceicu Hasdeu (q.v.) (1838–1907), author of historical and philological works, of a drama in verse, and many other writings. The dominant figure of the period was, however, Vasile Alecsandri (q.v.) (1821–90), its most typical representative. While the modern generations have entirely discarded his prose writings and only little enjoy his historical dramas in verse, Alecsandri's comedies and vaudevilles in the manner of Scribe prove still interesting for their grotesque representations of old Rumanian society, and his lyrics, especially those written after 1867, denote genuine talent.

When Rumania was made a kingdom (1881) the larger part of her national aspirations was realized. The attention of the statesmen and the public now turned to internal conditions, which were not wholly satisfactory. A less optimistic and more critical and realistic tendency now prevailed in literature, which reflected the complexity of Rumanian society. German, Russian, and other foreign ideas were now added to the French. A strong impetus to literary activity along national and democratic lines came from Transylvania, where appeared several writers of great talent. This epoch is illustrated by the greatest Rumanian poets—Michael Eminescu (q.v.) (1850–89), a philosophical and melancholy poet of unsurpassed style, and the Transylvanian Gheorghe Coșbuc (born 1866), an exuberant exponent of the peasants' feelings and ideas and translator of Kalidasa, Vergil, and Dante. Other poets of note are the Shelleyan A. Naum, the Leopardian O. Carp (Proca); the social poets A. Vlahuța (born 1858) and D. Zamfirescu, also authors of novels; the dramatist and translator of Horace, C. D. Olañescu (died 1908); the moderns Artur Stavri and H. Lecca (the latter also author of society dramas); the nationalists I. Nenițescu (died 1901), G. Chembach (Gheorghe din Moldova), and Octavian Goga, founder of the Budapest periodical *Luceafărul* (*The Morning Star*); several women, Veronica Micle (1850–89), Matilda Cugler-Poni, and Maria Cunțan; and many others. The folklore style of writing by Anton Pann found eminent representatives in Ioan Creangă and Petre Ispirescu (1838–87). One of the best prose writers, Barbu Ștefănescu-Delavrancea (born 1858), wrote realistic short stories from the life of the peasants, provincial town dwellers, and the corrupt elements of society, and also historical dramas. The greatest dramatic author, however, is Ioan Luca Caragеale (1853–1912), the Gogol of Rumanian literature, who continually attacked in his comedies, satires, and feuilletons the corruption, ignorance, and other shortcomings of certain elements of the middle class. He also wrote admirable short stories and tales and a powerful drama unique in Rumanian literature. Good novels are still scarce in this period, but the short story and the sketch were brought to a high degree of perfection from the points of view of language, truth, and psychological insight. Omitting some of the names already mentioned, the best narrators and novelists include Joan Slavici (born 1848), a most faithful and loving portraitist of the Transylvanian peasant, and his followers I. Rusu Sirianu, C. Sandu-Aldea, D. Anghel, and I. Agârbiceanu; M. Sadoveanu, who is in prose what Coșbuc is in poetry; N. Gane (born 1835), a poet, who likes to depict the peasants and old landed gentry; I. Brătescu-Voinești, who sketches plain everyday people; I. Ciocârlan, I. A. Basarabescu; Emil Gârleanu (Emilgar, died 1914), and numerous other writers. A Socialist group of writers which appeared in 1881 could not maintain itself. It comprised, however, a few writers of talent, such as the novelists Ștefan Basarabeanu (V. Crăsescu), author of *The Jew*, G. Adam, Sofia Nădejde, a woman, and the critic Dobrogeanu Gherea. To the same group may be added, perhaps, the poet A. Macedonski, who also tried French poetry. The predominant tendency of modern Rumanian literature, however, has remained national in spite of the cosmopolitan influence of western and northern literary models. Among the modern historians of Rumania mention must be made of A. D. Xenopol (whose method rather classes him with the older school), I. Bogdan, D. Onciul, and especially N. Jorga (q.v.). The philologists include O. Densușianu, M. Gaster, H. Tiktin, I. Bărbulescu, L. Săineanu, A. Candrea, and S. Pușcariu. See the bibliography of the article on Rumanian Language.

The oral literature of the people is to a large extent common to the Balkan people and Ukrainians. Its prose elaborations consist of tales (*basme*, Slav.), anecdotes (*snoave, glume*, Slav.), proverbs (*zicători*, Lat.; *vorbe*, Slav.), and the like. The epic poetry is not so rich as that of the Servians, but compares favorably with the Bulgarian. Lyric effusions (*doine*, a word of uncertain origin) are numerous and beautiful. Dance songs (*hore*, Slav., etc.), carols (*colinde*, Slav., etc.), elegies, orations,

riddles (*ghicitori*), incantations (*descântice*, Lat.; *farmece*, Lat. and Gk.), and satirical utterances are likewise well represented. Dramatic representations accompany the Nativity and are known as *Vicleim* (Bethlehem) and *Irozi* (Herod). The transition to artistic literature is formed by romances and tales of Oriental and even Occidental origin (such as *Till Eulenspiegel*), apocryphal and other legends and prayers, and various ethical and religious writings which circulate among the people.

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RUMBOLD, rŭm'bōld, Sir Horace (1829–1913). An English diplomat. He succeeded his father as eighth Baronet. In 1849 he became an attaché at Turin, Italy, and afterward held offices in British legations in China, Greece, Russia, and Turkey. He was Minister to Chile in 1872–78, to Switzerland in 1878–79, to Argentina in 1879–81, to Norway and Sweden in 1881–84, to Greece in 1884–88, to the Netherlands in 1888–96, and from 1896 to 1900 served as Ambassador to Austria-Hungary. He was author of *Recollections of a Diplomatist* (1902); *Further Recollections* (1903); *Final Recollections* (1905); *Francis Joseph and his Times* (1909).

RUMBURG, rŭm'bŭrk. A town of Bohemia, Austria, 25 miles northwest of Reichenberg on the Saxon frontier (Map: Austria-Hungary, D 1). It has extensive manufactures of linen, cotton, and woolen goods. Pop., 1900, 10,388; 1910, 11,158.

RUME'LIA, Eastern. Formerly an autonomous Turkish province, constituted by the Berlin Treaty of 1878 and administered by a Christian governor. As a result of the revolutionary movement of 1885 it was united with Bulgaria on September 18 of that year. The union was confirmed by an agreement at Constantinople in April, 1886, which, however, gave the district of Kirjaby, 633 square miles, to Turkey. The remainder of Eastern Rumelia remains an integral part of Bulgaria (Map: Balkan Peninsula, E, F 3). It includes the departments of Burgos, Philippopolis (Plovdiv), and Stara-Zagara, whose combined area is stated as 12,585 square miles and whose population, mostly Bulgarian, was 1,099,984 in 1900 and 1,241,778 in 1910 (censuses of December 31). The central part is occupied by a wide plain intersected in a southeasterly direction by the valley of the Maritza, the principal river. In the southwest are the Rhodope Mountains. The valleys along the tributaries of the Maritza are known for their rose gardens. Good tobacco is grown on the northern slopes of the Rhodope. The chief town is Philippopolis (pop., 47,981 in 1910).

RÜMELIN, rü'me-lēn, Gustav (1815–88). A German statistician and author, born at Ravensburg, Württemberg. After studying theology at Tübingen he finally became professor at the Gymnasium of Heilbronn in 1849, having in the meanwhile been a delegate to the Frankfort Parliament in 1848. He was head of a department in the Ministry of Public Instruction from 1856 to 1861, when he became director of the Statistic-Topographical Bureau. He became chancellor of Tübingen University (1870). Aside from various statistical and miscellaneous publications he produced *Shakespeare-Studien* (2d ed., 1874).

RUM'FORD. A town, including Rumford Falls village, in Oxford Co., Me., 57 miles northwest of Lewiston, on the Androscoggin River and on the Maine Central Railroad (Map: Maine, B 4). It has the Mechanics Institute and a Carnegie library. There are large paper mills and chemical works, deriving abundant water power from the falls on the river. Pop., 1900, 3770; 1910, 6777.

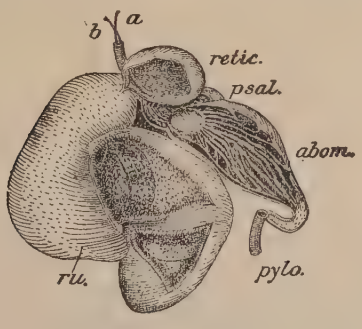
RUMFORD, Benjamin Thompson, Count (1753–1814). An American physicist, born at Woburn, Mass., March 26, 1753. He entered a merchant's office at Salem at the age of 13, at the same time studying medicine and physics. At 19 he married a rich widow originally from Rumford (later Concord), N. H., and was made major of militia by the English Governor. The distrust of the colonists at this period, near the outbreak of the American Revolution, drove him to Boston, and when Washington compelled the evacuation of Boston, Thompson was sent to England as bearer of dispatches. In London he won the favor of the government and received an appointment in the Colonial Office and was soon afterward made Undersecretary of State. Continuing, at the same time, his scientific investigations, he was elected, in 1779, fellow of the Royal Society. On the resignation of North's ministry he returned to America and fought for the royal cause. At the end of the Revolutionary War he obtained permission from the British government to enter military service in Bavaria. He rapidly rose to the rank of lieutenant general and Minister of War and was created Count of the Holy Roman Empire, when he chose Rumford as his titular designation. In 1795 he visited London. Having long and carefully studied the phenomena of heat, he set himself to devise a remedy for the smoky chimneys and discovered the principles upon which fireplaces and chimneys have since been constructed. He maintained, in his *Enquiry Concerning the Source of Heat which is Excited by Friction* (read before the Royal Society on Jan. 25, 1798), that heat is not an imponderable substance, as it was generally assumed to be in those days and indeed as it was held to be until the middle of the nineteenth century. In 1799 he retired from Bavarian service and returned

to London, where, at his instance, the Royal Institution was founded in the following year. He finally settled in Paris and devoted himself to improvements in artillery and illumination. There he married (his first wife having died in 1792) the widow of Lavoisier (q.v.), but they separated and Rumford retired to Auteuil, where he died (Aug. 21, 1814). He founded, and was the first to receive, the Rumford medal of the Royal Society, and he also founded a like medal to be awarded by the American Academy of Arts and Sciences and endowed a chair at Harvard. A memoir of Rumford by George E. Ellis was published, with a complete edition of his works, by the American Academy of Arts and Sciences (Boston, 1870–75). Consult also E. E. Slosson, in *Leading American Men of Science*, edited by D. S. Jordan (New York, 1910).

RUMI. See JALĀL-UD-DĪN RŪMĪ.

RU'MINANT (from Lat. *ruminare*, to chew the cud, from *rumen*, throat). One of the group of large grazing animals which chew a cud, classified by Cuvier as an order (Ruminantia), but now regarded as a group of the suborder Artiodactyla, the cloven-hoofed or even-toed Ungulata (q.v.). The ruminants include all of the cloven-hoofed herbivores except the swine and hippopotamus, i.e., the chevrotains, camels, deer, giraffes, cattle, antelopes, sheep, goats, musk ox, and some extinct families. All these are alike in that their dentition and digestive organs are adapted to that peculiar method of mastication called chewing the cud. Except the camels they have no incisors in the upper jaw, the front of which is occupied by a callous pad. The grass is collected and rolled together by means of the long tongue; it is firmly held between the lower cutting teeth and the pad and then torn and cut off. In the lower jaw there generally appear to be eight incisors, but the two outer are more properly to be regarded as canines. In front of the molar teeth there is a long vacant space (diastema) in both jaws. The molars are six on each side in each jaw; their surface exhibits crescent-shaped ridges of enamel, i.e., they are of the solenodont type. See TEETH; and illustration of cow's skull, under CATTLE.

The stomach is composed of four distinct bags or cavities, except in the chevrotains, where the third is absent. In the camels the stomach is imperfectly divided into four chambers and



STOMACH OF A RUMINANT.

a, *b*, probes in the gullet; *retic.*, reticulum; *psal.*, psalterium; *abom.*, abomasum; *ru.*, rumen (paunch); *pylo.*, pylorus.

has special peculiarities. (See CAMEL.) In all ruminants the first pouch of the stomach, into which the gullet leads, is, in the mature animal, by far the largest and is called the paunch or rumen. Into this the food first passes. It is lined with a thick membrane, presenting numerous prominent hard papillæ, secreting a fluid in which the food is soaked. The second cavity is the honeycomb bag, or reticulum, so called from its being lined with a layer of chambers like those of a honeycomb. The second pouch has also a direct communication with the œsophagus and fluids pass immediately into it, but sometimes or partly also into the other cavities. The third pouch is the manyplies or psalterium, so called because its lining membrane forms many deep folds, like the leaves of a book, beset with small, hard tubercles. This also communicates directly with the œsophagus by a sort of prolongation of it. The fourth pouch, which is of more elongated form than any of the others and is second in size, is called the reed or rennet, or abomasum. It is lined with a velvety mucous membrane in longitudinal folds, and here the gastric juice is secreted. In young animals it is the largest of the four cavities, and it is only when they pass from milk to crude vegetable food that the paunch becomes enlarged and all the parts of the complex stomach come fully into use. The food consumed passes chiefly into the first cavity, but part of it also at once into the second (as the animal wills), and when in a mashed or in a much comminuted state, into the third. When the paunch is well filled and the animal is at rest, it begins the process called chewing the cud, or ruminating. This may occur while the animal is standing, but more commonly when lying down. The first step is a spasmodic movement of the paunch and diaphragm like a hiccough and a reversal of the peristaltic movement of the œsophagus, by which a ball of food is brought up into the mouth from the rumen or reticulum. It is then chewed steadily for some time until thoroughly mixed with the saliva, when it is reswallowed, but passes by the first two pouches and enters the psalterium, from which it goes on into the abomasum and intestine, which in this group is always long, as also is the cæcum. For an account of the evolution of this apparatus and the ruminant habit, see ALIMENTARY SYSTEM, EVOLUTION OF.

The head of the ruminant is elongated, the neck is always of considerable length, the eyes are placed at the side of the head, and the senses of smell and hearing, as well as of sight, are extremely acute. The head in many ruminants is armed with horns, which in some are found in both sexes, in some only in the male, while in others they are entirely wanting. The ruminants are generally gregarious; they are distributed over almost the entire world, even in the coldest regions, but none are natives of Australia and comparatively few occur in America. Africa is the home of most of the species. The group is divisible into three sections: (1) Tragulina, embracing the chevrotains (Tragulidæ), which are the oldest ruminants, going back to the Eocene and Oligocene, and the extinct family Protoceratidæ of the Miocene of America, which resemble the ancestral tragulines; (2) Tylopoda, including the camels; and (3) Pecora, or horned ruminants, composed of the deer (Cervidæ), giraffes (Giraffidæ), prong-horns (Antilocapridæ), cattle, sheep, and goats (Bovidæ), and certain fossil forms. The flesh of most of the ruminants is fit to be used for human food; the fat (tallow) hardens more on cooling than the fat of other animals and even becomes brittle. The fat, hide, horns, hoofs,

hair, bones, entrails, blood, and almost all parts are useful to man.

RUMINATING HOG. See OREODON.

RUMOR. See FAMA.

RUMP PARLIAMENT. The name given in English history to the remnant of the Long Parliament after the expulsion of the Presbyterian members by a body of soldiers under Thomas Pride (q.v.) on Dec. 6, 1648. On Feb. 21, 1660, Monk recalled the Presbyterian members who had been expelled by Pride's Purge, and the Long Parliament, thus restored, issued writs for a new free Parliament and voted its own dissolution on March 16, 1660. See bibliography under LONG PARLIAMENT.

RUMSEY, rŭm'zĭ, JAMES (1743–92). An American mechanical engineer, born in Maryland. In 1786, 21 years before Fulton built the *Clermont,* Rumsey exhibited on the Potomac, in the presence of Washington, a boat propelled by machinery, in which a pump worked by steam power drove a stream of water from the stern and thus furnished the motive power. This idea, which originally was proposed by Bernouilli, has since figured in many schemes for propelling vessels. A society, of which Franklin was a member, was formed to aid his project. He obtained patents for his invention in Great Britain, Holland, and France. He published a *Short Treatise on the Application of Steam* (1788).

RUN (AS. *rinnan, eornan, irnan, iernan, yrnan,* Goth., OHG. *rinnan,* Ger. *rinnen,* to run). In vocal music, a rapid passage executed on one syllable. A run is merely an embellishment, in no way essential to the melodic outline. Runs are also frequently introduced in instrumental music. See GRACE NOTES; PASSAGE.

RUNCIMAN, rŭn'sĭ-măn, WALTER (1870–). An English politician, born in South Shields, the son of Sir Walter Runciman (born 1847), head of the Moor line of freighting steamers. The son, after his education at Trinity College, Cambridge, went into the shipping business with his father and in 1896–1905 was a managing director of the Moor line. He was a Radical member of Parliament from Oldham in 1899–1900 and a Liberal representative from Dewsbury after 1902. He served in secretarial offices; was president of the Board of Education (1908–11) and of the Board of Agriculture (1911–14); and succeeded John Burns, in August, 1914, upon the outbreak of the European War, as president of the Board of Trade. This post he retained when Asquith's coalition cabinet was formed the next year.

RUNCORN, rŭn'kôrn. A river port in Cheshire, England, on the Mersey, 12 miles southeast of Liverpool (Map: England, D 3). The town is the terminus of the Bridgewater and the Mersey and Irwell canals. It has iron foundries, chemical works, shipbuilding yards, tanneries, etc. Large quantities of freestone are shipped and it is the greatest centre of canal traffic in England. Its shipping returns are included in those of Manchester. A viaduct 1500 feet long and 95 feet above high water crosses the Mersey here. Pop., 1901, 16,490; 1911, 17,353.

RUNEBERG, rōō'ne-bĕr'y', JOHAN LUDVIG (1804–77). A celebrated Swedish poet of Finland, born at Jakobsstad. He graduated at the University of Abo and was successively lector in Latin literature at the University of Helsingfors, editor of the *Helsingfors Morgonblad,* and lector at the Borgâ Gymnasium. His first publication was lyric *Dikter* (*Poems,* 1830), followed by the *Grafven i Perrho* (*The Grave in Perrho,* 1831) and by *Ælgskyttarne* (*The Elk Hunters,* 1832), the fine epic which confirmed his fame. His further works comprise *Nadeschda* (1841); *Kung Fjalar* (*King Fjalar,* 1844), an unrhymed epic of ancient Norse times; *Fänrik Ståls Sägner* (*Ensign Ståls Stories,* 1848, 1860), a series dealing with the war of independence of 1808; *Kungarne på Salamis* (*The Kings at Salamis,* 1863), a stately tragedy in the true Greek manner. He is classic in simplicity and finish, free from the conventionalities of the time, and not lacking in a certain quaint humor. There is an edition of his collected writings (6 vols., 1873–74), which contains the completest biography yet written, but the best edition of his works is *Samlade Arbeten* (8 vols., 1899–1902) by Estlander and Appelquist. To this should be added *Efterlemnade Skrifter* (3 vols., 1878–79).

RUNES (AS. *rūn,* ONorse, Icel., *rún,* letter, writing, secret, mystery, Goth. *rūna,* OHG. *rūna,* Dan., Norw., Ger. *rune,* Swed, *runa,* Fr. *rune,* mystery, secret letter). The earliest alphabet in use among the Germanic peoples. In Old Norse magic signs as well as magic charms are designated as runes. There is nothing in the meaning of the word to have prevented it from being chosen by the primitive Teutons as their designation of the alphabet in general, since the mysterious connection between spoken sound and written symbol is sufficient to justify such a name. The use of runes for incantations and magic formulas is easily explicable. The magic power was easily transferred from the contents of these incantations to the signs themselves. The countries in which traces of the use of runes exist include Denmark, Norway, Sweden, Ireland, Germany, Great Britain, France, Spain, and Rumania. They are found engraved on rocks, monumental stones, crosses, coins, house utensils, etc. Especially important are the runes on the so-called bracteates, thin golden plates, chased on one side and used as neckwear. The inscriptions on articles of use contain generally the name of, or a brief account of, the maker or owner of the article. Rune inscriptions on stone are found only in Scandinavia and England. The most noteworthy English runes are on a pillar in Bancastle in Cumberland, on a cross in Ruthwell in Dumfriesshire, and on a casket in the British Museum (Franks casket, or Clermont casket).

In the Icelandic sagas the so-called revels or rune staves are mentioned frequently as bearers of epistolary communications. The sagas report further that rune poems were carved on these staffs. The oldest and most frequent reports of Norse literature, however, show that runes were carved on staves and utensils for divinations, spells, magic, and incantations. Runic manuscripts occur only in Scandinavia, the oldest of them being as late as the thirteenth century. Under the influence of the Church, Latin script in general supplanted the runes as a literary medium, although they remained in use in Scandinavia among the lower classes, especially in the rune calendars which have survived up to the present day. In the Anglo-Saxon kingdoms of Northumbria, Mercia, and East Anglia there are traces of runic writing dating from the middle of the seventh to the middle of the tenth century.

The date of the origin of runes is believed not to be later than the second century A.D. Probably their origin is from a much earlier time. The earliest historical date is the fourth century A.D., when the Gothic Bishop Ulfilas (q.v.), in devising the Gothic alphabet, in southeastern Europe a few years after their expedition of 267 into Asia Minor. An alphabet used by Galatian Celts is then regarded as the source, which in turn was based upon the Greek and Latin alphabets. Very much more probable is the view that the runes are based,

RUNIC ALPHABET

—	I	II	III	IV	V	VI	VII	VIII	—	IX	X	XI	XII
1. *f*	ᚠ	ᚠ	ᚠ *fé*	ᚠ *feu*	ᚠ	ᚠ	ᚠ	ᛉ	*f*	ᚠ	ᚠ *feoh*	ᚠ *fe, feoh*	*fe*
2. *u*	ᚢ	ᚢ	ᚢ *úr*	ᚢ *ûr*	ᚢ ᚢ	ᚢ	ᚤ	ᛎ	*u*	ᚢ	ᚢ *úr*	ᚣ *úr*	*uraz*
3. *þ*	ᚦ	ᚦ	ᚦ *purs, þorn*	ᚦ *thuris*	ᚦ ᚦ (ᚦ=ð)	ᚦᛞ	ᚦᚦ	ᛁ	*p*	ᚦ	ᚦ *þorn*	ᚦ *dorn*	*thyth*
4. *a*	ᚨ	ᚨ	ᚨ ᚨ *óss*	ᚨ *ös*	ᚨ ᛆ(=o, ᚪ=ø)	ᚨ	ᚨ	—	*o*	ᛟ	ᚩ *ós*	ᚩ *ós*	*aza*
5. *r*	ᚱ(ᚱ)	ᚢ	ᚱ *reið*	ᚱ *rât*	ᚱ	ᚱ	ᚱ	ᚲ	*r*	ᚱ	ᚱ *rád*	ᚱ *ræda*	*reda*
6. *k*	ᚲ(ᚳ)	ᚲ	ᚴ *kaun*	ᚴ *chaon*	ᚴ	ᚴ	ᚴ	ᚳᚳ	*k*	ᚳ	ᚳ(ᚴ) *cén*	ᚳ *cén*	*chozma*
7. *g, ȝ*	ᚷ	ᚷ	—	—	ᚴ	—	—	—	g^1	ᚷ	ᚷ *gyfu*	ᚷ *geofu*	*geuua*
8. *w*	ᚹ(ᚹ)	ᚹ	—	—	ᚹ	—	—	—	*w*	ᚹ	ᚹ *wenn(wén)*	ᚹ *uyn*	*uuinne*
9. *h*	ᚺ(ᚻ)	ᚺ	ᚺᚻ *hagall*	ᚼ *hagal*	ᚼ	ᚾ	ᚾ	ᛝ	*h*	ᚺ	ᚺ ᚼ ᚺ *hægl*	ᚻ *hægil*	*haal*
10. *n*	ᚾ(ᚿ)	ᚾ	ᚾ *nauð*	ᚾ *naut*	ᚾ	ᚾ	ᚾ	ᛃ	*n*	ᚾ	ᚼᚾ *nýd*	ᚾ *náeld*	*noicz*
11. *i*	ᛁ	ᛁ	ᛁ *íss*	ᛁ *îs*	ᛁ	ᛁ	ᛁ	ᛁ	*i*	ᛁ	ᛁ *ís*	ᛁ *is*	*iiz*
12. *j*	(ᛋ)ᛃ	ᛦ	ᛋᚼᚾ *ár*	ᚾ *âr*	ᚾ (ᚨ=a, ᚾ=æ)	ᚿ	ᚿ	ᛇ	*j*	ᚾ	ᛜ (ᚾ) *gér*	ᛜ *gáer*	*gaar*
13. *ło?*	ᛚ	ᛇ	—	—	—	—	—	—	*?*	ᛚ	SZ *óoh*	ᛇ *ih*	*uuaer?*
14. *p*	ᛈ	ᚹ	—	—	ᛒ B	—	—	—	*p*	ᛕ	ᚼ *peorð*	ᛈ *peord*	*pertra*
15. *z, R*	ᛉ	ᛯ							x^2	ᛉ	ᛉ(ᛝ) *eolhxsecg*	ᛉ *ilcs*	*ezec?*
16. *s*	ᛊ(ᛋ)	ᛋ	ᛋᛘ *sól*	ᛋ *sôl*	ᛋᛁ	ᛁ	ᛁ	ᛁ	*s*	ᛁ	ᛋ(ᛋ) *sigel*	ᛋ *sygil*	*sugil*
17. *t*	ᛏ	ᛏ	ᛏ *týr*	ᛏ *tiu*	ᛏᛏ	ᛘ	ᚴ	ᛎ	*t*	ᛏ	ᛏ *tir*	ᛏ *ti*	*tyz*
18. *b, ð*	ᛒ(ᛒᛒ)	ᛒ	ᛒ *bjarkan*	ᛒ *brica*	ᛒ B	ᚿ	ᚿ	ᛗ	*b*	ᛒ	B *beorc*	ᛒ *berc*	*bercna*
19. *e*	ᛖ	ᛖ	—	—	ᚼᚼ	—	—	—	*e*	ᛖ	M *eh*	M *eh*	*eyz*
(22. *ƿ*)	—	—	—	—	—	—	—	—	(ƿ)	ᛝ	—	—	—
(21. *l*)	—	—	—	—	ᚴ	—	—	ᛍ	—	—	—	—	—
20. *m*	ᛗ(ᛗ)	ᛗ	ᛗᛘᛘ *maðr*	ᛘ *man*	ᛘᛘ	ᛏᛏ	ᛏ	ᛏ	*m*	ᚺ	ᛗ *man*	ᛗ *mon*	*manna*
21. *l*	ᛚ	—	ᛚ *lǫgr*	ᛚ *lagu*	—	ᛚ	ᛚ		*l*	ᛚ	ᛚ *lagu*	ᛚ *lagu*	*laaz*
22. *ƿ*	ᛜ(ᛜᛊ)	—	—	—	—	—	—	—	*ƿ*	—	ᛝᛝ *ing*	ᛝ *ing*	*enguz(=x)*
23. *o*	ᛟ	—	—	—	—	—	—	—	*œ*	—	ᚩ *épel*		*utal*
24. *d, ð*	(ᛞᛞ)	—	—	—	ᛏᛏᛏ	—	—	—	*d*	ᛗ	ᛞ *dœg*	ᛞ *dæg*	*daaz*
(15. *-R*)	—	—	ᛘᛦ *ýr*	ᛦ *ûr*	ᛦ(ᛘ = *y*)	ᛁ	ᛁ	ᛎ	—	—	—	—	—
(23. *o*)	—	—	—	—	—	—	—	—	(œ)	ᛜ	—	ᛟ *œdil*	—
25.	—	—	—	—	—	—	—	—	*a*	ᚫ	ᚫ *ác*	ᚫ *ác*	—
26.	—	—	—	—	—	—	—	—	*œ*	ᚬ	ᚬ *æsc*	ᚬ *aer*	—
27.	—	—	—	—	—	—	—	—	*y*	ᛅ	ᛅ(ᛅᛅᛅ) *ýr*	—	—
28.	—	—	—	—	—	—	—	—	*eo*	—	ᛇ *eo iar*	—	—
29.	—	—	—	—	—	—	—	—	*ea*	ᛠ	ᛠ *ear*	ᛠ *eor*	—
(27.)	—	—	—	—	—	—	—	—	(*y*)	—	—	ᛅ *ýr*	—
30.	—	—	—	—	—	—	—	—	*q*	—	ᚳᚹ *cweorð*	—	*quertra?*
31.	—	—	—	—	—	—	—	—	*st*	—	ᛊᛏ *stán*	—	—
32.	—	—	—	—	—	—	—	—	g^2	—	ᛝ(ᛝ) *gár*	—	—

I, alphabet of the oldest Norse inscriptions. II, alphabet of the fibula of Charnay. III, alphabet of the later Norse inscriptions. IV, Norman abecedarium. V, alphabet of the latest Norse inscriptions. VI, alphabet of the stone of Rök. VII, alphabet of the ring of Forsa. VIII, runes of Helsing. IX, alphabet of the Thames knife. X, alphabet of the Anglo-Saxon rune song. XI, Anglo-Saxon alphabet of the Salzburg manuscript. XII, names of the Gothic letters in the Salzburg manuscript.

borrowed his signs for *u* and *o* from the runic alphabet. The question of the source of the runic alphabet is still not altogether settled. The ordinarily accepted view is that of an exclusive derivation of the runes from the Latin alphabet. In 1898 the theory was presented that the runes were invented by Goths not directly upon the Latin, but on a Western Greek alphabet.

The special modifications of the runic alphabet are partly due to the needs of carving on wood, and engraving on metal or stone, partly to the difference in the sounds of the Teutonic language and the unlearned primitive rendi-

tion of distant models. Some of the sounds have remained obviously Græco-Italic, as

ᚠ = F, ᚱ = R, ᚺ = H, and ᛊ = S.

Others deviate more or less, as

ᛏ = T, ᛗ = M, or ᚾ = N.

The different systems of runes, about a dozen varieties in all, accord up to a certain point. They may be classed under three main divisions, German, Norse, and Anglo-Saxon. The Norse runes exhibit an especially marked division into two alphabets, an earlier one of 24 characters and a later one of 16. These latter correspond to our *f, u, th, a, r, k, h, n, i, a, s, d, b, l, m, y,* but there is no equivalent for various sounds which existed in the language. In consequence of this the sound of *k* was used for *g, d* for *t, b* for *p,* and *u* and *y for v; o* was expressed by *au,* and *e* by *ai, i,* or *ia.* Expedients came, in the course of time, to be employed to obviate the deficiency of the system, as the addition of dots and the adoption of new characters. The runic system received a fuller development among the Germans and Anglo-Saxons, particularly the latter, whose alphabet was extended to something like 40 characters, which seem to have embraced, more nearly than any modern alphabet, the actual sounds of the language.

The runic signs are arranged in an order apparently quite distinct from that of any other alphabetical system and have a purely Teutonic nomenclature. Each letter is, as in the Hebrew-Phœnician, derived from the name of some well-known familiar object, with whose initial letter it corresponds. The direction of the writing is both from left to right and from right to left and occasionally also boustrophedon (q.v.). The full Old Norse alphabet of 24 signs is divided into three octads, traces of which are found also with other runic alphabets. The alphabet is often called Futhark or Futhorc, based on the usual abecedarium of the first five characters. The futhark, in its series *p, z, (r), s, t,* distinctly exhibits the usual alphabetic arrangement. It is probable that *f* and *a* exchanged places owing to the similarity of their signs, while *b* (pronounced something like *v*) and *u* changed places because they were similar in sound. A number of other reasonable assumptions of interchange and displacement bring back most of the runes to the order in which they should be expected, since they originate from the common source of alphabets.

In the accompanying table, taken from the monograph of Sievers on the runes in Paul's *Grundriss der germanischen Philologie,* the variations and development of the runic alphabets may be traced.

The Celtic races, from their connection with the Scandinavians, became acquainted with their alphabet and made use of it in writing their own language.

Bibliography. The study of the runes may be commenced most handily with the compact treatise of Sievers, "Runen und Runen-Inschriften," in Hermann Paul, *Grundriss der germanischen Philologie,* vol. i (2d ed., Strassburg, 1901). The grammar of the Norse runes is treated by Noreen in the same work, vol. iv (3d ed., ib., 1913). The standard work on the Norse runes is L. F. A. Wimmer, *Runeskriftens Oprindelse og Udvikling i Norden* (Copenhagen, 1874; Ger. trans. by F. Holthausen, enlarged, *Die Runenschrigt,* Berlin, 1887). George Stephens, *The Old Northern Runic Monuments of Scandinavia and England* (4 vols., London, 1866–1901), contains the fullest collection of plates, although the explanations are untrustworthy. His *Handbook of the Old Northern Runic Monuments* (London, 1884) is a condensed treatment of the same subject. The Danish runes are treated in L. F. A. Wimmer, *De Danske Runemindesmæker* (4 vols., Copenhagen, 1893–1908). The standard treatment of the Norwegian runes is Sophus Bugge, *Norges Indskrifter med de ældre Runer* (2 vols., Christiania, 1891–1913); id., *Norges Indskrifter med de yngre Runer* (ib., 1902); Olsen, *Runerne i den oldislandske Litteratur* (Copenhagen, 1883). On Swedish runes O. v. Friesen is preparing *Om runeindskriftens härkomst* (Upsala, 1904 et seq.). An important work on the Norse runes is Fritz Burg, *Die älteren nordischen Runeninschriften* (Berlin, 1885). The principal work on the continental (German) runes is R. Henning, *Die deutschen Runendenkmäler* (Strassburg, 1889). A standard discussion of the most important of the English runes, including a grammar and glossary, is Wilhelm Vietor, *Die northumbrischen Runensteine* (Marburg, 1895). The Manx runes are discussed in P. M. C. Kermode, *Manx Crosses* (London, 1907).

RUNGE, rün'gĕ, Carl David Tolme (1856–). A German mathematician, born in Bremen and educated at the universities of Munich and Berlin. In 1904 he accepted the chair of applied mathematics in the University of Göttingen. In 1909–10 he was exchange professor at Columbia University. He did important work in spectroscopy, particularly in the study of the Zeeman Effect (q.v.). He wrote, notably: *Praxis der Gleichungen* (1900); *Theorie und Praxis der Reihen* (1904); *Analytische Geometrie der Ebene* (1908); *Graphical Methods* (1912), Columbia University Lectures.

RUNJIT SINGH, rün-jēt' sĭng'h'. See Ranjit Singh.

RUNKLE, rŭŋ'k'l, Bertha Brooks (Mrs. Louis H. Bash) (?–). An American novelist, born at Berkeley Heights, N. J. She was the author of *The Helmet of Navarre* (1901); *The Truth about Tolna* (1906); *The Scarlet Rider* (1913); *Straight down the Crooked Lane* (1915).

RUNKLE, John Daniel (1822–1902). An American mathematician and educator, born at Root, Montgomery Co., N. Y. He graduated in 1851 at the Lawrence Scientific School of Harvard University and was professor of mathematics in the Massachusetts Institute of Technology from 1865 until his retirement as professor emeritus in 1902. He was also acting president of the institute in 1868–70 and its president from 1870 to 1878. Manual training was introduced into the institute curriculum largely at his instance. He founded the *Mathematical Monthly* in 1859 and continued its publication until 1861. His publications include: *New Tables for Determining the Values of Coefficients in the Perturbative Function of Planetary Motion* (1856); *The Manual Element in Education* (1882), reprinted from the *Reports* of the Massachusetts Board of Education; *Report on Industrial Education* (1883); *Elements of Plane and Solid Analytic Geometry* (1888).

RUNNING AMUCK. See AMUCK, RUNNING.

RUNNING SPIDER. A spider of the family Lycosidæ. They are long-bodied and hairy, but in size are smaller than the trapdoor spiders, which they sometimes resemble. Their colors are usually black and white or brown and gray and in general simulate the coloring of their surroundings. The females carry their eggs in round cocoons attached to their spinnerets, and the young, after issuing from the eggs, are for a short time carried on the back of the mother. Most of the North American species belong to the genera *Lycosa* and *Pardosa*. Consult J. H. Emerton, *The Common Spiders of the United States* (Boston, 1902), and J. H. Comstock, *The Spider Book* (New York, 1912).

RUNNING TOAD. See NATTERJACK.

RUNN OF CUTCH, or KATCH. See CUTCH, GULF OF; INDUS.

RUNNYMEDE, rŭn'nĭ-mēd. A pseudonym of Disraeli, in *The Letters of Runnymede* (1836).

RUNNYMEDE, or **RUNNIMEDE.** A long stretch of green meadow, lying along the right bank of the Thames, 20 miles west of London. Magna Charta was signed by King John, June 15, 1215, either on this meadow or on Charter Island a short distance off the shore.

RUPEE, rōō-pē' (Hind. *rūpīya, rupīya,* from *rūpa,* silver). A silver coin, the general unit of value in India, first coined in 1542. The Madras rupee of 11.664 grams $\frac{11}{12}$ fine was adopted in the Presidency of Bombay soon after 1818 as the Company's rupee. The value of the rupee is about 32 cents, the coin passing in India at 15 to the pound sterling. The rupee is legally divided into 16 annas of 12 pies, but other divisions are still current.

RU'PERT (RUPPRECHT MARIA LUITPOLD FERDINAND) (1869–). Crown Prince of Bavaria, son of Louis III, born at Munich. He was married to the Grand Duchess Marie Gabriele in 1900 and his heir Prince Leopold was born in 1901. He attended the University of Munich in 1889 and the Kriegsakademie in 1890. He rose through the grades as an army officer to major general in 1900 and lieutenant general in 1903, and served as inspector general in 1913–14. At the opening of the European War in August, 1914, Rupert took the field as commander in chief of the Bavarian army. See WAR IN EUROPE.

RUPERT, PRINCE (1619–82). A nephew of Charles I of England and his ablest cavalry leader in the Civil War. He was born at Prague, Dec. 17, 1619, the son of the Elector Palatine Frederick V. He served in the Thirty Years' War on the Protestant side in the Netherlands and in Westphalia and in 1638 he was taken prisoner, but secured his release in 1642 in time to take service under Charles I at Nottingham. He was given command of the cavalry and he fought impetuously and successfully at Worcester, Edgehill, and Brentford in 1642. In 1643 he made himself master of Bristol. He took part in the disastrous battles of Marston Moor (1644) and Naseby (1645). His surrender of Bristol in September, 1645, so angered the King that he was deprived of his command and requested to leave England. He declined to do so and submitted to a court-martial, which partially acquitted him. In 1648 he received the command of the English Royalist fleet, and for nearly three years kept his ships afloat. In 1651, however, Blake attacked the Prince's squadron at Malaga and sank most of his ships. With the vessels remaining Rupert escaped to the West Indies, where, with his brother Maurice, he led a buccaneering life. After the loss of his brother at sea Rupert went again in 1653 to France and later to Germany, remaining abroad until the Restoration in 1660, when he returned to England and served on sea against the Dutch in the wars of that period. The last 10 years of his life were spent in retirement in chemical and other researches. Although he did not discover the art of engraving in mezzotint, the real inventor of which appears to have been a German, Von Siegen, Rupert did much to make the art widely known. Consult: Eliot Warburton, *Memoirs of Prince Rupert and the Cavaliers* (3 vols., London, 1849); Lord Ronald Gower, *Rupert of the Rhine* (ib., 1890); Eva Scott, *Rupert, Prince Palatine* (New York, 1900).

RUPERT (or RUPRECHT), SAINT (?–718). "The apostle of the Bavarians," a descendant of the royal family of Franks. In 694, when he was Bishop of Worms, he was invited by Theodor II to preach in Bavaria and is said to have baptized Theodor and many other nobles. The Church celebrates both the day of his death, March 27, and that of the transportation of his relics, September 24. The oldest biography of Rupert, written in the tenth century, *Gesta Sancti Hrodberti Confessoris,* is still preserved in the University library of Graz. It was published in the *Archiv für österreichische Geschichte,* vol. lxiii (1882).

RUPERT'S DROP. See ANNEALING.

RUPERT'S LAND. A name formerly applied to the Canadian territory lying around Hudson Bay. See NORTHWEST TERRITORIES.

RUPP, rup, JULIUS AUGUSTUS LEOPOLD (1809–84). A German Protestant theologian and one of the founders of the "free congregations" (q.v.). He was born at Königsberg, where he studied theology, became lecturer on philosophy (1830), and served for several years as preacher at the Royal Chapel. His liberal spirit having involved him in trouble with the Consistory, Rupp became leader of the Free church movement, the programme of which he published in his *Der Symbolzwang und die protestantische Gewissens- und Lehrfreiheit* (1843). For a sermon against the Symbolum Athanasianum he was deprived of his benefice by the Consistory, and when elected preacher by the German Reformed church in Königsberg the royal confirmation was refused. This led him to form at Königsberg in 1846 a "free congregation." In 1851 he was forced to resign from the faculty of the university. His *Literarischen Nachlass* was published by Schultzky in 1891–92.

RUPTURE. See HERNIA.

RUPTURE OF THE STOMACH. See HORSE.

RURAL CREDIT. The problem of providing credit facilities for agriculture falls under two heads: (1) short-term or personal credit, to carry the farmer from seedtime to harvest or to relieve him in case of emergency—destruction of crops by storm, loss of live stock, etc., and (2) mortgage or long-time credit, to make possible the acquisition or permanent improvement of land. When the supplying of rural credit is permitted to remain an appendage of ordinary commercial banking and finance, the

requirement of personal credit is met by credit sales by merchants, agricultural implement and supply companies, or by personal loans from local capitalists. In the former case the farmer is forced to pay excessive prices and is often practically reduced to serfdom under the merchant. In the latter case he is almost invariably subjected to usurious rates of interest. For long-time loans the farmer is forced to depend on local supplies of capital, often inadequate and available only at onerous terms; high interest and commission rates, short terms, with attendant danger of foreclosure. Hence in every advanced nation agrarian statesmanship has addressed itself with more or less effectiveness to the task of creating appropriate rural credit institutions as an essential to agricultural prosperity. In this field by far the most successful work has been done by Germany, and the rural credit institutions of other countries are largely an adaptation of the German system.

Personal Credit. The impetus to the organization of rural credit for the small farmer was given by the work of Friedrich Wilhelm Raiffeisen (q.v.), who organized in 1849 a coöperative loan bank at Flammersfeld with a capital of $1500. The plan proving successful, he organized a second at Heddesdorf in 1854. The movement spread slowly at first, but its advantages proved so great that before the close of the century the whole of Germany was dotted over with agricultural credit unions, the number exceeding 1800 in 1915. In 1886 the movement was organized in Austria and by 1915 the number of unions had risen to over 8000. In Italy there are similar unions to the number of about 2500. In other European countries the movement is gaining impetus, and an analogous movement has taken root in Canada since 1906, where 150 or more people's banks have been organized under the initiative of Alphonse Desjardins.

The original principles of the Raiffeisen system, which have been modified more or less in transplantation, are the following: (1) Unlimited liability of the members of each union for all the debts incurred by it. (2) Limitation of membership to persons living in a single district —hence to persons known to the original members to be thrifty, industrious, and sober. (3) No capital stock; or if stock is required by law, only one share to each member, and this of small par value ($2 to $10) and restricted to a modest dividend. (4) All profit to be carried to reserve, and not distributable to members even in case of winding up the union, but in that event applicable to a specified public purpose. (5) Loans only to members, for purposes prospectively profitable, after careful investigation by a managing committee.

The capital for loans is secured (1) through deposits by members, on which interest of two or three per cent is paid; (2) through loans from other credit unions, secured through regional associations of credit unions; (3) through sale of bonds by the central association, to which the great majority of the local unions are affiliated. The central association, having an unimpeachable financial standing, can borrow freely at a low rate of interest, and makes loans to the local unions at rates slightly higher, to cover expense. The stock in the central union is held by the local unions. The net result of the system has been to supply the German small farmer with the capital he requires at extremely low rates (about 5½ per cent). Losses through bad debts are almost negligible, and are covered in the interest charge.

In Hungary the credit unions are moderately subsidized by the state, and in France through the Bank of France.

Mortgage or Long-Term Credit. For an account of European long-term credits, see MORTGAGE BANKS.

In the United States neither personal nor mortgage credit institutions have reached a satisfactory stage of development. In the corn belt the life insurance companies have made extensive loans on farm mortgages at reasonable rates, but one-third of all such investments are made in the one State of Iowa. In the rest of the country the farm loan capital is supplied chiefly by local lenders, with the attendant evils of high interest and frequent foreclosures. Since 1910 there has been an active agitation to secure institutions comparable to those of European countries. In 1913 a business men's commission and a commission of the Federal government visited Europe to investigate rural credit institutions. In 1914–15 a number of bills were introduced in Congress for the creation of a system of rural credit, but no action was taken upon them. New York and Massachusetts enacted laws permitting the formation of agricultural credit societies, and eight Western States have authorized the lending of certain State funds, usually school funds, on mortgage. In response to the general agitation for rural credits a number of joint stock loan companies have been organized in Middle Western States. Of personal credit institutions corresponding with the Raiffeisen system the United States had not even a beginning, in 1916. Consult report of the Rural Credits Commission, Senate Doc. No. 214, 63d Cong., First Session (Washington, 1914); Herrick, *Rural Credits* (New York, 1914); Morman, *Principles of Rural Credits* (ib., 1915); Morgan, *Land Credits* (ib., 1915).

RURAL DEAN. The title of an ecclesiastical officer, such as was generally known in the early ages of the Church as an archipresbyter, whose duty it is to exercise a certain oversight, under the bishop, within a small subdivision of a diocese. The office was introduced into England about the year 1052. It was revived during the nineteenth century and its holders charged with inspection of church work and organization as deputies of the archdeacon or bishop. Some of the dioceses of the Protestant Episcopal church in the United States have developed a system of rural deaneries, in which the clergy meet at stated times in convocation. Similar officials in the modern Roman Catholic church are sometimes known as rural deans, sometimes as *vicarii foranei*.

RU'RIK (ONorse *Hrörekr*, Russ. *Rjurik*). The founder of a Russian Empire. According to Nestor, the earliest Russian chronicler, he was the leader of a band of Northmen or Varangians (q.v.) who, in response to an invitation extended by the Slavs of Novgorod, settled in that city in 862. He died in 879. Many noble families in Russia still claim descent from Rurik. Consult: V. L. P. Thousen, *The Relations between Ancient Russia and Scandinavia and the Origin of the Russian State* (Oxford, 1877); V. O. Klutchevski, *History of Russia*, vol. i (New York, 1911); K. Gjerset, *History of the Norwegian People*, vol. i (ib., 1915). See NESTOR; RUSSIA.

RURY OGE, rōō'rī ōge. See O'MORE, ROBY.

RUSBROEK, JAN VAN. See RUYSBROEK, JAN VAN.

RUSBY, rŭz'bē, HENRY HURD (1855–). An American botanist and physician, born at Franklin, N. J. He graduated M.D. from New York University (1885), made botanical investigations in South America in 1885–87 and in 1896, and after 1888 was professor of botany, physiology, and materia medica in the department of pharmacy of Columbia University. He held also the chair of materia medica at the university and Bellevue Hospital Medical College from 1897 to 1902. As an expert on drugs Rusby was employed by the United States Bureau of Chemistry (1907–09) and in 1911 he was instrumental in the vindication of Harvey W. Wiley (q.v.), the noted pure-food expert. Rusby served as president of the American Pharmaceutical Association (1909–10). Besides editing the 7th and 8th revisions of the *United States Pharmacopœia*, he wrote various works on botany, pharmacy, and materia medica.

RUSCHENBERGER, rŭsh'en-bĕrg'ẽr, WILLIAM SAMUEL WAITHMAN (1807–95). An American physician, born in New Jersey, and educated in New York and Philadelphia, graduating M.D. from the University of Pennsylvania in 1830. Meanwhile he had served for a short time (in 1826) as surgeon's mate in the United States navy and later he reëntered the service. Retiring as surgeon and senior officer of the medical corps of the navy in 1869, he spent the rest of his life in Philadelphia. Among his works are: *Three Years on the Pacific* (1834); *A Voyage around the World* (1838; republished in England); *Elements of Natural History* (1850); *Notes and Commentaries during Voyages to Brazil and China* (1854); *An Account of the Institution and Progress of the College of Physicians of Philadelphia during One Hundred Years* (1887).

RUŠČUK, or **RUSCHUK.** See RUSTCHUK.

RUSCUR'RUS, or **RUSUCUR'RUS.** See DELLYS.

RUSELLÆ. See GROSSETO.

RUSH, BENJAMIN (1745–1813). An American physician and patriot, born at Byberry (now included in Philadelphia), Pa. He graduated at Princeton in 1760 and after studying in Edinburgh (M.D., 1768), London, and Paris was appointed professor of chemistry in the Philadelphia Medical College (now the medical department of the University of Pennsylvania) upon his return to Philadelphia in 1769. He was elected a member of the Continental Congress and was a signer of the Declaration of Independence. He saw active service as surgeon at the front in 1776–78, when he resigned and joined the Conway Cabal (q.v.) against Washington. Returning to Philadelphia he again took up his duties, and founded the Philadelphia Dispensary in 1785 and also, it is said, the College of Physicians, which seems to have been consolidated with the University of Pennsylvania. He took part in 1780 in the formation of the new State constitution and was a member of the Pennsylvania convention for the ratification of the Federal Constitution. He did efficient work during the yellow-fever epidemic of 1793. Rush was opposed to solidism, and was a strong adherent of the bloodletting theory. A good account of his theories and methods is given by S. Weir Mitchell in *The Red City* (1908). In 1799 he was appointed treasurer of the United States Mint at Philadelphia, and retained this position till his death. Rush was a founder of Dickinson College, vice president of the Philadelphia Bible Society and of the American Philosophical Society, and president of the Philadelphia Medical Society, as well as of the Society for the Abolition of Slavery. He published *Medical Inquiries and Observations* (1789–98; 3d ed., 1809); *Essays* (1798; 2d ed., 1806); *Diseases of the Mind* (1812; 5th ed., 1835); and writings on slavery, on temperance and health, and on politics. His essays on the diseases and vices of the Indians are a valuable addition to our knowledge of the American aborigines.

RUSH, FRIAR. A household sprite, somewhat resembling Robin Goodfellow, who once took service as scullion at a monastery and led the monks into evil ways. The German form of the name is Rausch. In *L'Allegro* and *Marmion* he is confused with Will-o'-the-Wisp.

RUSH, RICHARD (1780–1859). An American lawyer, statesman, and diplomat, born in Philadelphia, a son of Dr. Benjamin Rush. He graduated at Princeton in 1797, studied law, and was admitted to the bar in 1800. In 1811 he was made Attorney-General of Pennsylvania, in the same year was appointed Comptroller of the United States Treasury, and in 1814 became Attorney-General of the United States. In 1817, after being for a short time Secretary of State, he was sent as Minister to England, where he negotiated many important treaties. He returned to the United States in 1825 to become Secretary of the Treasury. He became a Democrat in the early thirties. In 1836 he was sent by President Jackson to England to get the legacy left by James Smithson for the building of the Smithsonian Institution. From 1847 to 1851 he was Minister to France and he was the first foreign representative to recognize the Republic of 1848. Rush superintended the publication of *The Laws of the Nation* (5 vols., 1815) and wrote: *Narrative of a Residence at the Court of London* (1833); a second volume of the same work (1845; 3d ed., 1873); *Washington in Domestic Life* (1857).

RUSH, WILLIAM (1756–1833). An American sculptor, born in Philadelphia. He was apprenticed to a carver and at first made figureheads for vessels. Those done for the American frigates *United States* and *Constellation* and for other vessels attracted much attention and are excellent pieces of modeling. Rush possessed great facility, ingenuity of ideas, and a sense of the graceful. As he worked entirely in wood or clay, most of his original statues have perished, but his full-length statue of Washington (1814) still stands in Independence Hall, Philadelphia. Rush was one of the founders of the Pennsylvania Academy and exercised a salutary influence on the development of sculpture in his city.

RUSH'DEN. A manufacturing town in Northamptonshire, England, 4½ miles southeast of Wellingborough. Pop., 1901, 12,460; 1911, 13,354.

RUSH'VILLE. A city and the county seat of Rush Co., Ind., 40 miles southeast of Indianapolis, on the Cincinnati, Hamilton, and Dayton, the Cleveland, Cincinnati, Chicago, and St. Louis, the Fort Wayne, Cincinnati, and Louisville, and the Pittsburgh, Cincinnati, Chicago, and St. Louis railroads (Map: Indiana, F 5). The city manufactures furniture, woodworking

machinery, foundry products, carriages, flour, and lumber products, and trades in grain, cattle, hogs, and sheep. Pop., 1900, 4541; 1910, 4925.

RUSH'WORTH, JOHN (c.1612–90). An English historian, educated, according to Wood, at Oxford and called to the bar at Lincoln's Inn in 1647. He was secretary to Lord Fairfax (1645–48), sat in five Parliaments for Berwick, became secretary to the Council of State (1660) and secretary (1667) to Sir Orlando Bridgeman, the Lord Keeper. Late in life his affairs became embarrassed and he spent his last six years in the King's Bench Prison, Southwark. Rushworth is known for his *Historical Collections of Private Passages of State, Weighty Matters of Law, Remarkable Proceedings in Five Parliaments,* covering the period from 1618 to 1648. The work, comprising eight volumes, appeared in four installments (1659, 1680, 1692, 1701).

RUSK, JEREMIAH MCLAIN (1830–93). An American farmer, soldier, and political leader, born in Morgan Co., Ohio. In 1853 he removed to Vernon Co., Wis. When the Civil War broke out he raised a regiment and was commissioned major. He took part in the campaign against Vicksburg and in August, 1863, was promoted lieutenant colonel. He was with Sherman in the Meridian campaign, displayed great gallantry in the battles around Atlanta, and was brevetted brigadier general. He was a member of Congress from 1871 to 1877 and was Governor of Wisconsin from 1882 to 1889. In the latter year President Harrison appointed him Secretary of Agriculture, a new cabinet portfolio. This he held till 1893.

RUSK, THOMAS JEFFERSON (1802–56). An American soldier, born in Camden, S. C. He studied law under John C. Calhoun, began practice in Georgia, and in 1834 removed to Texas, where he was a member of the convention which declared Texas independent (1836), acted as Secretary of War, and succeeded Houston in command of the Texan army. From 1838 to 1842 he was justice of the Supreme Court of Texas. He took a prominent part in bringing about annexation, and in 1846–56 was a Democratic member of the United States Senate. He committed suicide while insane.

RUS'KIN, JOHN (1819–1900). An English author, art critic, and reformer, born in London, Feb. 8, 1819. His boyhood and youth he depicted with great charm in *Præterita.* His father, John James Ruskin, a shrewd and artistic Scotchman, was then settled in London, where he prospered as a wine merchant, eventually amassing a fortune of £200,000. The boy was educated at home by his mother, a strict Evangelical Puritan. Private tutors taught him Latin, Greek, and French. He studied drawing under Runciman, Copley Fielding, and later with Harding. In verse his masters were Rogers, Byron, and Shelley. He accompanied his father and mother on many tours through England, visiting the lakes, read and wrote verse, sketched, and in 1835 saw the Alps and Italy. He entered Christ Church, Oxford, in 1836. His university course was interrupted by illness. Threatened with consumption, he traveled with his parents in England and on the Continent. At Oxford, where he graduated B.A. in 1842, he won the Newdigate prize with a poem entitled *Salsette and Elephanta* (1839). In 1843 appeared the first volume of *Modern Painters,* the primary design of which was to prove the superiority of modern landscape painters, especially Turner, to the old masters; but in the later volumes (ii, 1846; iii and iv, 1856; v, 1860) the work expanded into a vast discursive treatise on the principles of art. *Modern Painters* was revolutionary in its spirit and aim and naturally excited the aversion and hostility of conservatives.

The first artists to accept Ruskin were a group of young men known as the Pre-Raphaelites (q.v.). Convincing and memorable is his defense of them against popular ridicule in his essay entitled *Pre-Raphaelitism* (1851). While *Modern Painters* was in progress Ruskin published other books on art, *The Seven Lamps of Architecture* (1849), *The Stones of Venice* (vol. i, 1851; vols. ii and iii, 1853), both of which aimed to introduce a new and loftier conception of the significance of architecture. Like the later volumes of *Modern Painters* they were illustrated by Ruskin himself, an accomplished draftsman. Still other works on art flowed from his pen—*Lectures on Architecture and Painting* (1853), *Elements of Drawing* (1857), *Political Economy of Art* (1857), and annual notes on the Royal Academy. Meanwhile he had also published *Poems* (1850) and the beautiful fairy tale *The King of the Golden River* (1851).

However varied Ruskin's writings had been hitherto, they bore a close relation to art. But in *Unto this Last* (*Cornhill Magazine,* 1860) the artistic purpose, though present, is less apparent. Here Ruskin began his attack on the "dismal science" called political economy, to be continued in *Munera Pulveris* (1862–63), *Time and Tide* (1867), and *Fors Clavigera* (1871–84), a series of letters to the workmen of England, far above their heads. To this later period belong also *Sesame and Lilies* (1865), charming essays on literature and other subjects; *Ethics of the Dust* (1866); *The Crown of Wild Olive* (1866; complete, 1873), lectures on work, traffic, and the future of England, with an eloquent introduction; *The Queen of the Air* (1869), a study of Greek myths of cloud and storm; *Aratra Pentelici* (1872), on sculpture; *Love's Meinie* (1873), on birds; *Ariadne Florentina* (1873–76), on wood and metal engraving; *Val d'Arno* (1874), on Florentine art of the thirteenth century; *Mornings in Florence* (1875–77), further studies in Italian art; *Proserpina* (1875–86), studies of wayside flowers; *Deucalion* (1875–83), on rocks; *St. Mark's Rest* (1877–84), a manual on Venetian art; *The Bible of Amiens* (1880–85), intended as the first volume of a history of Christendom for boys and girls; *The Art of England* (1884); *Præterita* (1885–89), a review of his life; a volume of collected poems in 1891; and a large body of other essays. A famous reprint of his miscellanies is *On the Old Road* (1885). For many years Ruskin lectured before large audiences in London, Oxford, Cambridge, Edinburgh, and other places. From 1870 to 1879 he was Slade professor of art at Oxford; in 1883 he was reëlected to the chair, but resigned the next year, owing to ill health. With his fortune Ruskin embarked upon many charitable undertakings and through them his wealth dwindled away until his only income was from the sale of his books. This, however, amounted, from 1890 to 1900, to about £4000 a year. He long made his home at Denmark Hill, in London. In 1871 he bought Brantwood, a small

estate by Coniston Lake, where he passed his last years, and died Jan. 20, 1900.

As an art critic Ruskin was not generally accepted by artists. In this field his service was rather to awaken in his generation a sense for the beautiful. Of strong ethical temperament, he always insisted that beauty should not be divorced from righteousness. His political economy, tending to Socialism, has been attacked by the learned. With all its vagaries it was a noble plea for the higher things of the mind against utilitarianism. Against railways and factories marring the beauty of English landscape he took a firm stand, and for his age he discovered the beauties of river, cloud, and mountain. In the development of English prose he is likely to have a place as the one who moved prose towards verse without passing the boundary line. Of this new prose no better example could be cited than the introduction to *The Crown of Wild Olive*, with its assonances and grand rhythms.

Bibliography. For Ruskin's early life his own *Præterita*, published in many editions, is *the* authority, and the definitive biography is that by Sir E. T. Cook, *Life of John Ruskin* (2 vols., New York, 1911). Consult also: W. M. Rossetti, *Ruskin, Rossetti, Pre-Raphaelitism* (London, 1889); E. T. Cook, *Studies in Ruskin* (2d ed., ib., 1891); W. G. Collingwood (secretary to Ruskin, 1881–1900), *Life and Work of John Ruskin* (2 vols., Boston, 1893); id., *Life of John Ruskin* (rev. ed., ib., 1902), not a reprint, but rewritten on different lines from the earlier life; J. A. Hobson, *John Ruskin, Social Reformer* (ib., 1898); R. de la Sizeranne, *Ruskin and the Religion of Beauty*, translated from the French by the Countess of Galloway (New York, 1900); Frederic Harrison, *Tennyson, Ruskin, Mill, and Other Literary Estimates* (London, 1900); M. H. Spielmann, *Sketch of the Life and Work of John Ruskin* (Philadelphia, 1900); A. C. Meynell, *John Ruskin* (New York, 1900); I. M. Street, *Ruskin's Principles of Art Criticism* (ib., 1901); W. C. Brownell, in *Victorian Prose Masters* (ib., 1901); Frederic Harrison, *John Ruskin*, in "English Men of Letters Series" (ib., 1902); Ada Earland, *Ruskin and his Circle* (London, 1910); A. C. Benson, *Ruskin: A Study in Personality* (New York, 1911); E. T. Cook, *Homes and Haunts of Ruskin* (ib., 1912); A. L. Chevrillon, *The Philosophy of Ruskin* (ib., 1914).

RUSPINA. See the first article MONASTIR.

RUSS, JOHN DENISON (1801–81). An American philanthropist, born at Chebacco (now Essex), Essex Co., Mass. He graduated at Yale in 1823, studied medicine in America and abroad, and in 1826 began to practice in New York City. In 1827 he took part in the movement in aid of the Greek revolutionists, went to Greece in charge of the brig *Statesman*, conveying supplies, and established at Paros a hospital which he directed during part of the following year. In 1830 he returned to the United States. In 1832 he began the first systematic instruction of the blind undertaken in the United States, and in that year the New York Institution for the Blind, of which he had been a founder in 1831, began its work. He invented for the use of the blind a phonetic alphabet, a series of mathematical characters and raised maps. Russ was superintendent of the New York Juvenile Asylum in 1851–58.

RUS'SELL. The name of a famous English family whose descent emerges from obscurity with the career of Henry Russell, a merchant who was four times returned to Parliament for Weymouth between 1425 and 1442. Henry's great-grandson, John Russell (1486–1555), was created Earl of Bedford in 1550. His son Francis, the second Earl, was Lord Lieutenant of the northern counties in Queen Elizabeth's reign and, like his father, a Knight of the Garter. Another notable member of the family was Edward Russell, Earl of Orford (1653–1727), who held high naval commands under William III, distinguishing himself especially at La Hogue. (See HOGUE, LA.) Of recent members of the family the most celebrated was Lord John Russell (q.v.).

RUSSELL, ANNIE (1864–). An American actress, born in Liverpool, England, of Irish parents. She made her first appearance on the stage when only eight years of age at the Academy of Music, Montreal, Canada. In 1881, in New York, she won her greatest popular success in *Esmeralda*. Her first appearance in London was in 1898, when she scored a success in Bret Harte's *Sue*. She returned to London in 1905 and created the rôle of Barbara Undershaft in Bernard Shaw's *Major Barbara*. In 1910 she joined the New Theatre Company, New York, appearing in *Twelfth Night*, *The Nigger*, and other plays. In 1912 she organized the Old English Comedy Company, giving revivals of Shakespeare and Sheridan. She was married in 1904 to Oswald Yorke, an English actor.

RUSSELL, BENJAMIN (1761–1845). An American journalist, born in Boston. He enlisted in the Revolutionary army, where he rose to the rank of major. After the war he began the publication of a semiweekly journal, the *Columbian Sentinel*. This paper he controlled for 40 years and, assisted by Fisher Ames, Timothy Pickering, John Lowell, Stephen Higginson, and George Cabot as contributors, made it one of the most influential organs of the Federalist party. He was one of the aldermen of Boston, was a representative to the General Court, State Senator for a number of years, was one of the Governor's Council, and in 1820 was a member of the Constitutional Convention. He resigned as editor of the *Sentinel* in 1828, but continued to edit till 1830 the Boston *Gazette*, which he had established in 1795. It was Russell who originated the expression Era of Good Feeling (q.v.).

RUSSELL, BERTRAND (ARTHUR WILLIAM) (1872–). An English philosopher and mathematician, born in Trelleck, Monmouth, a grandson of Lord John Russell, first Earl Russell, and a brother and heir presumptive to the second Earl. He was educated at Trinity College, Cambridge, of which he became fellow and lecturer. Russell was a representative of symbolic or mathematical logic and a prominent critic of Bergson. In 1915 he visited the United States, where he lectured in behalf of peace. In the same year he received the Butler gold medal of Columbia University, awarded once in five years for distinguished contribution to philosophy or education. Russell became one of the most prominent leaders in the development of what is known as neorealistic philosophy. (See REALISM.) Among his important publications are: *German Social Democracy* (1896); *Essay on the Foundations of*

Geometry (1897); *Philosophy of Leibniz* (1900; in French, 1908); *Principles of Mathematics* (1903); *Philosophical Essays* (1910); *Principia Mathematica* (1910), with A. N. Whitehead; *Problems of Philosophy* (1911), a brief manual; *The Philosophy of Bergson* (1914), with H. W. Carr; *Our Knowledge of the External World as a Field for Scientific Method in Philosophy* (1914); *Scientific Method in Philosophy*, Lowell Institute Lectures at Boston (1915).

RUSSELL, Sir Charles Arthur. See Russell of Killowen.

RUSSELL, Charles Edward (1860–). An American journalist and Socialist leader. He was born at Davenport, Iowa, and graduated from St. Johnsbury (Vt.) Academy in 1881. Thereafter he engaged in journalism, published the Chicago *American* until 1902, later was an editorial writer on the New York *American*, and after 1904 was for the most part a contributor to magazines. He was the Socialist candidate for Governor of New York State in 1910 and 1912, for mayor of New York City in 1913, and for United States Senator from New York in 1914. In 1915, in opposition to most Socialists, he upheld military preparedness for the United States. His writings include: *Such Stuff as Dreams* (1902); *The Twin Immortalities* (1904); *The Greatest Trust in the World* (1905); *The Uprising of the Many* (1907); *Lawless Wealth* (1908); *Thomas Chatterton, the Marvelous Boy* (1908); *Songs of Democracy* (1909); *Why I Am a Socialist* (1910; rev. ed., 1915); *Business, the Heart of the Nation* (1911); *The Passing Show of Capitalism* (1912); *Stories of the Great Railroads* (1912; 2d ed., 1914); *The Story of Wendell Phillips* (1914); *Doing us Good and Plenty* (1914); *These Shifting Scenes* (1914), reminiscences.

RUSSELL, Charles Taze, better known as Pastor Russell (1852–1916). An American religious leader, born at Pittsburgh, Pa. Early in life he was a Congregationalist, but in 1878 became an independent minister at Pittsburgh. He became known chiefly as the author of a series of books under the general title of *Millennial Dawn* (6 vols., 1886–1904), also issued with slight changes as *Studies in the Scriptures*. These volumes, which lead up to a prediction of an imminent millennium, have been translated into many languages and at least 3,000,000 copies have been sold. In promotion of his work Russell traveled extensively, served as pastor of the Brooklyn Tabernacle, and edited a semimonthly, the *Watch Tower and Herald of Christ's Presence*. His followers, organized as bands of Bible students, numbered about 50,000 in 1915. Russell was also author of *Food for Thinking Christians: Why Evil was Permitted* (1881) and *Tabernacle Shadows of Better Sacrifices* (1881). His sermons were syndicated in 2000 newspapers.

RUSSELL, Charles William (1812–80). A Roman Catholic theologian and educator. He was born at Killough, County Down, Ireland, and was educated at Maynooth College, where he became professor of ecclesiastical history (1845) and president (1857). He wrote *The Life of Cardinal Mezzofanti* (1858), translated Leibnitz's *System of Theology* (1850), and compiled with J. P. Prendergast the *Calendar of the State Papers, Relating to Ireland, of The Reign of James I* (1872–77). Cardinal Newman in his *Apologia* attributes to him the chief share of his conversion to the Roman Obedience. Consult John Healy, *Centenary History of Maynooth College* (Dublin, 1895).

RUSSELL, David Allan (1820–64). An American soldier, born at Salem, N. Y. He graduated at West Point in 1845 and fought in the Mexican War. At the beginning of the Civil War he entered the volunteer service as colonel of the Seventh Massachusetts Volunteers, which he led through the Peninsular campaign. In 1864 he received the brevet of brigadier general and later of major general, and was killed in the battle of Opequan, Va.

RUSSELL, George W. ("Æ") (1867–). An Irish poet. For some time he studied art in Dublin, and of his paintings George Moore has spoken in high terms. Himself by nature a mystic, Russell became a great student of the books of the East and of mystics and transcendentalists. He was, too, a practical man of affairs whose good sense and understanding of the Irish people were of the greatest value to Sir Horace Plunkett (q.v.) in his plans for the economic improvement of rural Ireland. "Æ" 's lyrics are of rare beauty, among the best verse produced by the Irish Literary Revival. (See Irish Literature, *in English.*) Representative of his work are: *Homeward: Songs by the Way* (1894); *The Earth Breath and Other Poems* (1897); a selection of his poems, *Nuts of Knowledge* (1903); *The Divine Vision and Other Poems* (1904); *The Spirit of England* (1915); and *Collected Poems* (1915). Russell's three-act drama in prose, *Deirdre*, was several times performed by the Irish National Theatre Society. Of George Moore's account of his experiences of the Irish Literary Revival in the trilogy *Hail and Farewell* (New York, 1911–14) "Æ" may be called the hero, for he, almost alone, is left unscathed by the author's mordant irony.

RUSSELL, George William Erskine (1853–1919). An English politician and author, born in London. The son of Sir Charles Russell, he was educated at Harrow and at University College, Oxford. He entered politics as a Liberal, represented Aylesbury (1880–85) and North Bedfordshire (1892–95), and was Undersecretary of State for India in 1892–94 and for the Home Department in 1894–95. He published: *A Life of Gladstone* (1891); two series called *Collections and Recollections* (1898); *An Onlooker's Notebook* (1902); *Matthew Arnold* (1904); *Sydney Smith* (1905); *Fifteen Chapters of Autobiography* (1912); *Edward King, Sixtieth Bishop of Lincoln* (1912); *Half Lengths* (1913); *Selected Essays on Literary Subjects* (1915); *A Short History of the Evangelical Movement* (1915); *The Spirit of England* (1915). His wide acquaintance with English political and London society life made his reminiscences of much interest. His uncle was Lord John Russell. Consult A. G. Gardiner, *Pillars of Society* (London, 1913).

RUSSELL, Harry Luman (1866–). An American bacteriologist and educator. Born at Poynette, Wis., and educated at the University of Wisconsin (S.M., 1890), he took postgraduate work at Berlin, the Pasteur Institute, Paris, the Zoölogical Station at Naples, and Johns Hopkins University (Ph.D., 1892). In 1897 he became professor of bacteriology in the College of Agriculture of the University of Wisconsin and dean in 1907. Among his works are: *Outlines of Dairy Bacteriology* (1894; 10th

ed., with E. G. Hastings, 1914); *Agricultural Bacteriology* (1909), with Hastings; *Public Water Supplies* (1909), with T. E. Turneaure; *Experimental Dairy Bacteriology* (1909), with Hastings; *Agricultural Bacteriology for Students in General Agriculture* (1915), with Hastings.

RUSSELL, Henry (1812–1900). An English vocalist and song composer, the father of W. Clark Russell, born at Sheerness, Kent. In 1833–41 he traveled in the United States and Canada. In 1841 he returned to England and, after a series of successful recitals, began the presentation of an entertainment called "The Far West; or, The Emigrant's Progress from the Old World to the New," which did much to stimulate emigration to America. He composed about 800 songs. Consult his book of reminiscences, named for one of his best-known songs, *Cheer, Boys, Cheer* (London, 1895).

RUSSELL, Henry (1874–). A British impresario. He was born in London, England, and was professor of singing there and in Rome until 1904. In the latter year he directed the opera at Covent Garden Theatre, London, and in the following year came to the United States, becoming managing director of the Boston Opera House and of the Boston Opera Company, which went into bankruptcy and was disbanded in 1915.

RUSSELL, Howard Hyde (1855–). An American Congregational clergyman. He was born at Stillwater, Minn., was educated at Griswold and Indianola (LL.B., 1878) colleges in Iowa, and graduated from the Oberlin Theological Seminary in 1888. Russell is best known as the founder of the first Anti-Saloon League (in Ohio) in 1893. He was its superintendent until 1897 and was superintendent of the national Anti-Saloon League (q.v.) from its founding in 1895 to 1903. During this period he traveled throughout the country and established league organizations in 31 States. After 1909 he was active in the work of the Lincoln Legion, which is correlated with the Anti-Saloon League. He published *A Lawyer's Examination of the Bible* (1893).

RUSSELL, Irwin (1853–79). An American poet, born in Port Gibson, Miss. He was among the first to turn negro character to literary account. Russell wrote both in pure English and in dialect. His verses were collected after his death in *Poems* (1888), highly praised by Joel Chandler Harris (q.v.).

RUSSELL, Israel Cook (1852–1906). An American geologist, born near Garrattsville, N. Y. He graduated at New York University in 1872 and studied at the School of Mines of Columbia University. He was assistant professor of geology at the Columbia School of Mines from 1875 to 1877. In 1880 he was appointed geologist of the United States Geological Survey. In that capacity he made numerous explorations and surveys. In 1890–91 he conducted to the Mount St. Elias region expeditions, which made valuable contributions both to geography and to geology. He was appointed to the chair of geology in the University of Michigan in 1892. His more important works include: *Geological History of Lake Lahontan* (1885); *Lakes of North America* (1895); *Glaciers of North America* (1897); *Volcanoes of North America* (1897); *Rivers of North America* (1898); *North America* (1904). Russell was also a contributor to the New International Encyclopædia. In 1906 he was president of the Geological Society of America.

RUSSELL, James Earl (1864–). An American educator, born in Hamden, N. Y. He graduated at Cornell in 1887 and studied in Germany. After two years as professor of pedagogy and philosophy in the University of Colorado, he became in 1897 professor of education in the Teachers College, Columbia University, of which he was made dean in 1898. His publications include: *The Extension of University Teaching in England and America* (1895; Ger. trans., 1895); *German Higher Schools: The History, Organization, and Methods of Secondary Education in Germany* (1899; 3d ed., 1907); *Industrial Education* (1912).

RUSSELL, John (1745–1806). An English painter of portraits in pastel. He was born in Guildford, Surrey, and studied under Francis Cotes. Removing to London about 1768, he soon developed into the greatest painter in pastel of the early British school. He was appointed painter in crayons to George III and was elected Royal Academician (1788). His portraits, which have preserved their early freshness, are simply composed and accurately drawn. The color is luminous and brilliant, though in earlier works often crude. Many of the best are in English country houses, including Miss Faden, Mrs. Fitzherbert, Sir Joseph Banks, and Bartolozzi. His "Little Girl with Cherries" is in the Louvre and the Topham Family (1791) is in the Morgan collection (Metropolitan Museum, New York). He invented a method of preparing pastels explained in his *Elements of Painting with Crayons* (1772–77). Russell was also known as an amateur astronomer. He was especially prominent as a zealous convert to Methodism. His son William (1780–1870), for 40 years rector of Shepperton, also painted a few excellent pastels, sometimes confused with those of his father. Consult the monograph by Williamson (London, 1894) and Sée, *English Pastels* (London, 1911).

RUSSELL, Lord John, first Earl Russell (1792–1878). An English statesman, born at Westminster (London). He was the third son of the sixth Duke of Bedford. He was educated in Westminster School and at Edinburgh University. In July, 1813, he was returned to Parliament for the borough of Tavistock and entered the ranks of the Whigs. He was returned to Parliament for Huntingdonshire in 1820 and there became an ardent advocate of parliamentary reform. In 1828, against the united efforts of Peel, Huskisson, and Palmerston, he carried the repeal of the Test and Corporation Acts. He cordially supported the Catholic Emancipation Act, passed in 1829. As a member of Earl Grey's (q.v.) ministry, Lord John at once rose into great prominence through his part in the Reform Bill of 1832, the first reading of which he moved in the Commons. (See Parliament.) He subsequently took part in the agitation against the Corn Laws. On the resignation of Peel, in December, 1845, Russell was summoned to form a ministry, but was unable to do so, and Peel resumed office and brought about the repeal of the Corn Laws (q.v.). He was soon forced out on the question of Irish coercion. Again Russell was called upon to form a ministry, and this time he succeeded (July, 1846).

Russell continued as Premier for nearly six

years. The usual Irish discontent had been greatly augmented by the famine and all Ireland was ripe for rebellion. Russell handled the matter with much skill. Relief measures went hand in hand with coercive measures and in a few months Ireland was quieter than it had been for years. The most important act in this connection was the Encumbered Estates Act. (See IRISH LAND LAWS.) In 1851, as a result of the Pope's attempt to reëstablish the Catholic hierarchy in England, the Ecclesiastical Titles Assumption Act (q.v.) was passed. (See PALMERSTON, H. J. T.) In the coalition ministry of Whigs and Peelites formed December, 1852, under Lord Aberdeen, Russell appeared as Secretary for Foreign Affairs. The mismanagement exhibited in the operations of the Crimean War brought about a motion in the House of Commons for an inquiry into the conduct of the war. Russell was ill prepared to resist this and resigned. He then supported the motion and Aberdeen resigned. Derby and Russell each attempted to form a ministry, but without success. Palmerston was then called upon and succeeded. Russell was asked to join, but refused. He was then sent as Plenipotentiary to the conference at Vienna, which it was hoped would bring about peace. Meanwhile the Peelites had withdrawn and Russell in March, 1855, very reluctantly entered the ministry, though he still remained at the conference. On his return the opposition in Parliament raised a great outcry in regard to his proceedings at Vienna and being unable, by reasons of state, to account in full detail for his course, Russell resigned. Russell, in 1847, had won Gladstone to the support of his plea for the removal of political disabilities from the Jews and prevailed with the Commons to pass a bill for that end. This was defeated in the House of Lords. But he continued to press the matter, was successful in 1858, and the attempt, in 1880, to restore the disabilities was defeated by Gladstone. Lionel Rothschild (see ROTHSCHILD) was the first Jew elected to Parliament after the disabilities were removed. In 1859 Russell again appeared as Foreign Secretary under Palmerston. The Italian War of Liberation and the American Civil War were the most difficult questions he had to meet. To the Italians he gave his most ardent support. His conduct in regard to the American War has been defended and criticized, some claiming that he ably preserved British neutrality, others contending that the cases of the *Alabama*, *Florida*, etc., proved the contrary. In 1861 he was created Earl Russell. In 1865, on the death of Palmerston, Russell again became Premier. The new ministry now brought forward a parliamentary-reform bill. The Liberals, however, did not give hearty support to the bill and it was defeated. Russell at once resigned and never took office again. His last years were spent chiefly in literary work. He wrote several books, among them *The Life and Times of Charles James Fox* (1859–66). He died on May 28, 1878. Consult: Sir Spencer Walpole, *Life of Lord John Russell* (London, 1889); S. J. Reid, *Lord John Russell* (ib., 1895); *Lady John Russell: A Memoir*, edited by Desmond MacCarthy and Lady Agatha Russell (New York, 1911); *Early Correspondence of Lord John Russell*, edited by his son Rollo Russell (2 vols., London, 1913).

RUSSELL, JOHN SCOTT (1808–82). A British marine engineer and naval architect, born at Parkhead, near Glasgow. He studied at the universities of Edinburgh, St. Andrews, and Glasgow, and in 1832 was elected to the chair of natural philosophy at Edinburgh to fill a temporary vacancy. A paper which he read before the British Association on the nature of waves led to the appointment of a committee to make experiments, and these resulted in Russell's discovery of the wave of translation and his development of the wave-line system of shipbuilding. Another paper "On the Laws by which Water Opposes Resistance to the Motion of Floating Bodies," which he read before the Royal Society of Edinburgh in 1837, earned him the society's gold medal. In 1844 he removed to London, where he began to build vessels of the largest sizes. His two most famous ventures were the *Great Eastern* (q.v.), the failure of which forced him to abandon shipbuilding, and the armored frigate *Warrior*, which he helped to design and which was the first seagoing vessel of its kind. He was one of the founders of the Institution of Naval Architects, was for some time its vice president, and contributed frequently to its *Transactions*. He wrote a number of works on naval architecture.

RUSSELL, LILLIAN (LEONARD) (1861–1922). An American actress and vocalist, born at Clinton, Iowa. She appeared on the amateur stage in 1877, sang in *Pinafore* in 1879, and then appeared at Tony Pastor's Theatre, New York. Later she was prima donna of the McCaull Opera Company until, at the head of her own company, she presented *Virginia and Paul* (1883); *Polly* (1884–85); *The Queen of Brilliants* (1894); *Fiddle-dee-dee* (1900); *Lady Teazle* (1904); *The Butterfly* (1906), a great success; *Wildfire* (1907–08). Subsequently she entered vaudeville. She was married to A. P. Moore, editor and owner of the Pittsburgh *Leader*, in 1912.

RUSSELL, ODO WILLIAM LEOPOLD, first BARON AMPTHILL (1829–84). An English diplomatist. He was born at Florence, was privately educated, and entered upon a diplomatic career as attaché of the English Embassy at Vienna. From 1850 to 1852 he was under Lord Palmerston in the English Foreign Office. He was subsequently in diplomatic service at Paris, Vienna, Constantinople, Washington, and Florence, and from 1860 to 1870 was acting Minister at the Vatican. In 1871 he was appointed Ambassador at Berlin. In 1881 he was made a peer.

RUSSELL, SOL SMITH (1848–1902). An American actor, born at Brunswick, Mo. He served as a drummer boy in the Union army and in 1862 he became connected with a theatre at Cairo, Ill. He went to New York City in 1871 and in 1874 became a member of Daly's company. He began as a regular star in 1880 with a play called *Edgewood Folks*. The evenness and finish of his acting, his peculiarly quaint and gentle humor, and the truth and delicacy of his pathos won for him lasting popularity. Consult McKay and Wingate, *Famous American Actors of To-Day* (New York, 1896), and L. C. Strang, *Famous Actors of the Day in America* (Boston, 1900).

RUSSELL, THOMAS (1762–88). An English poet, a precursor of the Romantic movement and a reviver of the sonnet in England. Born in Beaminster and educated at Winchester and

at Oxford, he was ordained priest in the Anglican church in 1786. His studies carried him to the literatures of Italy, Spain, Portugal, Provence, and Germany. Eighteenth-century literature knows no better sonneteer than Russell at his best. It was not till 1789 that his *Sonnets and Miscellaneous Poems* appeared, edited anonymously but probably by William Howley, later Archbishop of Canterbury, and with a meagre memoir.

RUSSELL, William, Lord (1639–83). An English Whig Parliamentarian. He was the third son of William, fifth Earl Russell, and was educated at Cambridge. From 1660 to 1678 he was member of Parliament for Tavistock. In 1680, at the head of more than 200 members of the Commons, he carried to the House of Lords the Bill of Exclusion, directed against the Duke of York's succession to the throne. The King and the Duke determined to be revenged upon Russell and to crush the leaders of the Whig party. Charged as participators in the Rye House Plot (q.v.), Lord Russell and Algernon Sidney were arrested, arraigned for high treason, and by the aid of perjured witnesses and a packed jury were sentenced to death. Charles II was disposed to show mercy, but the Duke of York insisted upon the prisoners' death. The unconstitutional murder of Russell, followed by that of Sidney, led, in the next reign, to the overthrow of the Stuart régime. Consult Lord John Russell, *Life of William, Lord Russell* (London, 1820).

RUSSELL, William Clark (1844–1911). An English novelist. He was born in New York City, a son of Henry Russell, the writer of songs, was educated in England at Winchester and in France at Boulogne, and in 1857 shipped on an English merchantman. He followed the sea until 1865, when he settled in London and turned his attention to writing. In 1874 he brought out his first sea story, *John Holdsworth, Chief Mate*, and from that time on his success was assured and stories drawn from his experience and knowledge of the seafaring life followed one another in quick succession. His stories are written in a clear, picturesque style, display considerable dramatic skill, and are considered by seamen most faithful portrayals of life at sea. Among his works are: *The Wreck of the Grosvenor* (1875; new ed., 1900); *A Sailor's Sweetheart* (1880); *The Ship: Her Story* (1894); *The Convict Ship* (1894); *What Cheer!* (1895); *The Last Entry* (1897); *The Two Captains* (1897); *The Romance of a Midshipman* (1898); *The Ship's Adventure* (1899); *Overdue* (1903); *Abandoned* (1904); *His Island Princess* (1905); *Voyage at Anchor* (1905); *Yarn of Old Harbor Town* (1906); and lives of Dampier (1889), Collingwood (1891), and Nelson (1897).

RUSSELL, William Eustis (1857–96). An American lawyer and Governor, born in Cambridge, Mass. He was educated at Harvard and at the Boston University Law School. In 1880 he became a member of the Boston law firm of Russell and Russell, of which his father and two brothers were already members. In 1885 he was chosen mayor of his native city on the Democratic ticket and for two succeeding years was reëlected with no opposition. At his third nomination for Governor in 1890 he was elected and was reëlected in 1891 and 1892. In 1893 he resumed his law practice. His death checked a movement to nominate him for the presidency on a Democratic gold-standard platform.

RUSSELL, Sir William Howard (1820–1907). A British journalist, born in Ireland. He was educated at Trinity College, Dublin. He wrote for the London *Times* in 1841 and became attached to the parliamentary corps of that paper in 1843. His first important expedition as a correspondent was in 1854, when he was sent by the *Times* to the seat of the Crimean War. It is claimed that he really invented the office of the modern special correspondent. In 1858 he was sent to India by the *Times* on the occasion of the mutiny. In 1858 he returned to England and established the *Army and Navy Gazette* (1860). In 1861 he was sent by the *Times* as war correspondent to the United States, but returned after the first battle of Bull Run, when he rendered himself obnoxious to the Union leaders. He was present in 1870 at the siege and fall of Paris; in 1879–80, in South Africa; and in 1883–84, in Egypt. In 1895 he was knighted. His numerous books include: *The British Expedition to the Crimea* (1858); *My Diary North and South: Canada* (3 vols., 1863–65); *The Great War with Russia* (1895). Consult J. B. Atkins, *Life of Sir W. H. Russell* (2 vols., London, 1911).

RUSSELL OF KILLOWEN, Charles, Baron (1832–1900), A British jurist, born at Newry, Killowen, County Down, Ireland. He was educated at Trinity College, Dublin, studied law in Lincoln's Inn, and was called to the bar in 1859. He won early recognition as an advocate and in 1886 he was appointed Attorney-General in the Gladstone cabinet and again held that office from 1892 to 1894. He was counsel for the British claims before the Bering Sea Commission in 1893. Early in the following year (1894) he was made Lord of Appeal in Ordinary and created a life peer, and before the close of the year succeeded Lord Coleridge as Chief Justice, being the first Roman Catholic to hold that office since the Reformation. He delivered a remarkable address on international arbitration before the American Bar Association in 1896. In 1899 he was a member of the Venezuelan Boundary Arbitration Tribunal. In an unofficial capacity he was known in his conduct of the case of his friend, Charles Stewart Parnell (q.v.), before the Parliamentary Commission, in which he played a part in exposing the notorious Pigott forgeries published in the London *Times*. Consult R. B. O'Brien, *Life of Lord Russell of Killowen* (New York, 1901).

RUSSELL PROCESS. See Chloridizing.

RUSSELL SAGE FOUNDATION. An institution established in 1907 by Mrs. Russell Sage, who gave an endowment of $10,000,000, for "the improvement of social and living conditions in the United States of America." The work of the Foundation is distributed among a number of departments, including the Charity Organization Department, Department of Child Helping, Division of Remedial Loans, Department of Surveys and Exhibits, Department of Recreation, Division of Education, Committee on Women's Work, Southern Highland Division, and the Division of Statistics. The Foundation has made contributions to the subject of medical inspection of schools, to the question of retardation and elimination of pupils. The Division of Recreation is especially interested

in promoting the use of school buildings as social centres and the development of rational methods of recreation. The Division of Remedial Loans has through its publications thrown much light on the methods of loan sharks and has sought to develop coöperative or remedial loan societies. The Foundation has also supervised the development of a model suburban community, Forest Hills Gardens, Long Island. Consult L. P. Ayres, *Seven Great Foundations* (New York, 1911).

RUSSELL'S VIPER. See VIPER.

RUS'SELLVILLE. A city and the county seat of Pope Co., Ark., 75 miles by rail northwest of Little Rock, the State capital, on the St. Louis, Iron Mountain, and Southern and the Dardanelle and Russellville railroads (Map: Arkansas, B 2). It contains a State agricultural school. Russellville has a cottonseed-oil mill, a foundry, and an ice plant. Pop., 1900, 1832; 1910, 2936.

RUSSELLVILLE. A city and the county seat of Logan Co., Ky., 30 miles southwest of Bowling Green, on the Louisville and Nashville Railroad (Map: Kentucky, D 6). It is the seat of Bethel College (Baptist), opened in 1854, and of the Logan Female College (Methodist Episcopal, South), opened in 1856. Pop., 1900, 2591; 1910, 3111.

RUSSIA, rŭsh'à. An empire embracing one-sixth of the land surface of the earth. With an area of 8,764,586 square miles in 1914, it is nearly three times as large as the United States exclusive of Alaska. It includes more than one-half of Europe and the whole of northern Asia and has a larger continuous area than any other realm in the world. From east to west it spreads over 5400 miles, while its greatest width, from the Kara Sea to the Panur boundary, is 2400 miles. Its coast line is about 31,000 miles and its land frontier 12,800. The Arctic Ocean lies to the north and the Pacific Ocean to the east. The south frontier, dividing it from China, Afghanistan, Persia, and various native states under the protection either of Russia or Great Britain, is mainly marked by great natural features, such as the Amur River and the mountain ramparts of Sayan, Tian-Shan, and Alai-tagh, which overlook the widespread grassy steppes or sandy wastes of Central Asia. In the northwest and southwest the Empire touches the Baltic and Black seas, but elsewhere in the west it merges with the states of western Europe —Rumania and Austria-Hungary in the south, Prussia in the centre, and Sweden and Norway in the extreme north.

The Empire may be divided into four parts: (1) Russia in Europe (with Poland and the Grand Duchy of Finland); (2) the Caucasus (northern Caucasia, or Ciscaucasia, and Transcaucasia); (3) Siberia; (4) Russian Central Asia. The heart of this enormous state is Russia in Europe, or Russia proper. This article will deal especially with Russia in Europe at the opening of the Great European War of 1914 (see WAR IN EUROPE) and with the Asiatic domain of the Empire only in its relation to the Empire as a whole. For a treatment of the political divisions of Asiatic Russia the reader is referred to the appropriate headings. The mainland of Russia in Europe lies between lat. 44° 30′ and 70° N. and long. 17° 30′ and 65° 30′ E. Its area is 1,911,632 square miles, or a little more than two-thirds that of the United States exclusive of Alaska. It is separated from northwest Siberia by the northern Ural Mountains, south of which the boundary is artificially fixed to the east and south of the Urals to include within the domain of Russia proper all of the mountain mining districts. The valley of the Manytch between the Caspian and the Sea of Azov divides it from Caucasia and is sometimes considered the southern limit of Europe in that quarter, but more generally the Caucasus Mountains are accepted as the dividing line. The Black Sea, the Sea of Azov, and the north edge of the Danube delta complete its south boundary, and its west and north limits are those of the Empire as given above. The largest islands belonging to European Russia are the two called collectively Novaya Zemlya (Nova Zembla), in the Arctic Ocean.

Topography. In its surface features Russia is in striking contrast with the rest of Europe. Russia is a compact mass, irregularly quadrilateral in form, a physiographic province in itself, lacking the great diversity of plains, plateaus, highlands, deep valleys, and declivities which give endless variety to the surface features of western Europe and which have divided western Europe into detached masses and destined it to develop great, independent nationalities. As a whole Russia is a great plain stretching away in endless monotony from its western confines and the ice ocean on the north, and the plain is not limited by the European domain of the Empire, but extends beyond the Urals to Bering Sea in the extreme northeast and across the Turkestan steppes to Persia and Afghanistan in the south. Thus the plains of the Empire are far more extensive in Asia than in Europe. It was this plain that gave unrivaled opportunity for and direction to the vast territorial expansion of Russia. The Empire may be crossed to every ocean that touches it without leaving these vast low tracts where the horizon drops around the traveler as on a voyager at sea. The plain of European Russia in its general level is from 300 to 600 feet above the sea. A few areas, conspicuous only because of the monotonous uniformity of most of the country, rise to a height of over 1000 feet.

The higher altitudes of the interior of Russia are in the west along the foothills of the Carpathians, north and south, the heights of central Russia, and the heights of the Volga. The heights of central Russia culminate in the plateau of Valdai (1150 feet high). (See VALDAI HILLS.) It very clearly separates the low plains that border the Baltic from the low plains of the upper Volga. Slightly separated from this area of elevation by the valley of the Donetz, a tributary of the Don, are the so-called Mountains of Donetz, extending east and west, rising to 1225 feet and extending this ensemble of elevations almost to the Sea of Azov. The heights of the Volga extend on the right bank of the river from Nizhni Novgorod and Kazan to Tsaritsin, a distance north and south of 730 miles, attaining 1121 feet near Samara and 1314 feet to the west of Saratov. The greatest width of this area of elevation is about 230 miles. Farther east on the edge of Asia the Ural Mountains (q.v.) break the monotony of the plains. They are broken by deep gaps dividing them into three main sections known as the Northern, Central or Permian (from the Province of Perm), and Southern Urals. The Urals extend from north to south approximately along the meridian of 60° E. for 1500 miles, rising in the

5° A 10° B 15° C 20° D 25° E 30° F 35° G 40° H 45° J 50° K 55° L 60° M 65° N 70° O 75°
1
2
3
55°
60°
65°
ARCTIC OCEAN
North Cape
Tromsö
Hammerfest
Lofoden Islands
Vest Fjord
Bodö
Victoria Head
Arctic Circle
Storbacken
Gellivara
Kiruna
Kolari
Pello
Rovaniemi
Kemi
Kuusamo
Torneå
Luleå
Piteå
Skellefteå
Umeå
Trondhjem
Sollefteå
Ornskoldsvik
Hernösand
Sundsvall
Hudiksvall
Söderhamn
Gefle
Upsala
Stockholm
Helsingfors
Gulf of Finland
Reval
Dagö
Oesel
Arensburg
Gotland
Visby
Dome Neze
Gulf of Riga
Libau
Windau
Pillau
Memel
Tilsit
Eydtkuhnen
Wirballen
Suwalki
Lomza
Ostrolenka
Mlawa
Soldau
Neidenburg
Lyck
Johannisburg
Angerburg
Insterburg
Tilsit
Ragnit
Gumbinnen
Pillkallen
Goldap
Stallupönen
Tauroggen
Schaulen
Mitau
Riga
Dünaburg
Wilna
Grodno
Bialystok
Brest Litovsk
Pinsk
Kovel
Rovno
Lemberg
Przemysl
Jaroslau
Tarnow
Cracow
Kielce
Radom
Ivangorod
Warsaw
Lodz
Petrikau
Thorn
Bromberg
Posen
Kalisch
Konin
Gnesen
Inowrazlaw
Graudenz
Marienwerder
Dirschau
Danzig
Elbing
Pillau
Königsberg
Tilsit
Memel
Libau
Windau
Mitau
Riga
Pernau
Reval
Narva
Gulf of Finland
Helsingfors
Abo
Aland Is.
Gulf of Bothnia
Wasa
Nikolaistad
Karleby
Brahestad
Uleå
Torneå
Haparanda
Kasko
Christinestad
Jacobstad
Nykarleby
Kristinestad
Björneborg
Raumo
Nystad
Abo
Tavastehus
Helsingfors
Borgå
Fredrikshamn
Viborg
Kexholm
Sordavala
Kajana
Uleå
Kemi
Kuusamo
Kuusamo L.
Kemi L.
Torneå L.
Enare L.
Imandra L.
Nuot L.
Kola
Kola R.
Kandalaksha
Kandalaksha Bay
Konchozero
Lapland
Peninsula
Petsenga
Petsenga R.
Pechenga
Vardö
Vardö Is.
Varanger Fd.
Varanger Peninsula
Vadsö
Hammerfest
Tana R.
Tana Fd.
Lopphavet
Lodtsa R.
Lodtsa
Ribatchi Pen.
Motavski G.
Kola B.
Kanin Noss
C. Churni
Sviatoi Noss
Lambuski I. & B.
C. Orlov
Kanin Pen.
Kolguev I.
Chesskaia Bay
Pustozersk
Pustozerskoe
Arctic Circle
Great Tundra
Nova Zembla
S. Gooss C.
Kostin Shar
Mezhdusharskey
S. Laurens B.
Kara Sea
Burrough or Kara Str.
Waigatz I.
Waigatz Str.
Pae Dalo
Pae Khoi Mts.
Kara Bay
Yalmal Peninsula
Gulf of Ob
Kara R.
Gnetiu
Obdorsk
Obdorsk Bay
Yeraendri R.
Tchorovaia
Tchorovaia Bay
Liakhovski Tundra
Tundra
Ural Mts.
Ural R.
Polar Ural
Pae-Iz
Pae-Ver
Sosva
Ivdel
Ivdelskoe
Ivdelskaia
Ivdelskaia R.
Ivdelskaia Bay
Ivdelskaia Mts.

RUSSIA
SCALE OF STATUTE MILES
0 50 100 150 200 250
SCALE OF KILOMETERS
0 100 200 300 400
Important towns are shown in heavy face type.
Railways shown thus
PETROGRAD AND VICINITY
SCALE OF MILES
0 2 4 6
L.L.POATES ENGRG CO., N.Y.
35° Longitude G East 40° from H Greenwich 45° J 50° K 55° L
Kronstadt
PETROGRAD
Saratov
Astrakhan
Tiflis
Bak
Odessa
Sevastopol
Ekaterinoslav
Kharkov
Kiev
Rostov
Moscow
Tula
Riazan
Orel
Kursk
Voronesh
Penza
Simbirsk
Samara
Orenburg
Ufa
Perm
Kazan
Nizhni Novgorod
Vladimir
Smolensk
Minsk
Brest Litovsk
Warsaw
Lodz
Lublin
Cracow
Lemberg
Tarnopol
Volhynia
Podolia
Kherson
Nikolayev
Simferopol
Yalta
Kishineff
Bucharest
Chernavoda
Constanza
Danube
Dniester
Dnieper
Don
Volga
Ural R.
Caspian Sea
Black Sea
Azof Sea
Aral Sea
Sea of Azof
Gulf of Finland
Lake Ladoga
Lake Onega
Lake Peipus
Gulf of Riga
Gulf of Kara-Bogaz
Gulf of Kuma
Gulf of Taganrog
Kuban District
Batoum Dist.
Kars Dist.
Elizabethpol
Baku
Petrovsk
Derbent
Vladikavkaz
Novorossiysk
Batoum
Trebizond
Sinope
Samsun
Tokat
Amasia
Erzeroum
Erzingian
Sivas
Mt. Ararat
Nakichevan
Alexandrovsk
Krasnovodsk
Asunada
Michailovsk
Lenkoran
Kaisakoiny
Saliany
Kura R.
Gulf of Kizilagatch
Inner or Bukoyev Kirghiz Horde (To Orenburg)
Orenburg Kirghiz Little Horde
Cossacks of the Ural
Mertvyi Kultuk or Dead Bay
Kosa Uch
Kulali I.
Baku
Tiflis
Batoum
Kronstadt
Petrograd
Finland
Gulf of Finland
Lake Ladoga
Lake Onega
Lake Peipus
Gulf of Riga
Gulf of Kara-Bogaz
Gulf of Kuma
Gulf of Taganrog
Kuban District
Batoum Dist.
Kars Dist.
Elizabethpol
Baku
Petrovsk
Derbent
Vladikavkaz
Novorossiysk
Batoum
Trebizond
Sinope
Samsun
Tokat
Amasia
Erzeroum
Erzingian
Sivas
Mt. Ararat
Nakichevan
Alexandrovsk
Krasnovodsk
Asunada
Michailovsk
Lenkoran
Kaisakoiny
Saliany
Kura R.
Gulf of Kizilagatch
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Orenburg Kirghiz Little Horde
Cossacks of the Ural
Mertvyi Kultuk or Dead Bay
Kosa Uch
Kulali I.

north and south to upward of 5000 feet, with gentle slopes on their European face and more abrupt descents on the Asiatic side. The Central Urals, where the rainfall is much heavier than in its other sections, have on this account been more deeply denuded, are low in elevation, and the detritus has been scattered far over the plain on both sides of the range to a depth of 500 feet. The traveler approaching from the west observes nothing suggestive of mountains till he passes the water divide and looks down upon the plains of Siberia. With the exception of the south coast of the Crimea, where the Yaila Mountains, 100 miles long, with a culminating height of 5060 feet, and their spurs descend steeply to the sea, there are no other prominent elevations in Russia proper. A remarkable feature of the topography of Russia is the area of depression below the sea level in the southeast part of the country along the coasts of the Caspian, a region of sunken plains that is larger than all other depressions below sea level in the world. The Caspian Sea, now 85 feet below sea level, is undergoing desiccation. While the dominant character of the plain of Russia is monotony and this feature is maintained throughout the Empire over wide expanses of flat and low lands, the new parts of the Empire have manifold topographic aspects, so that the Russian domain as a whole has many varieties of land and scenery, from the tundras, plains, and low plateaus of Russia in Europe to the steppes both high and low in Asia, the lofty and wild mountain chains of Caucasia, and the many parallel belts of mountains, gridironed with transverse ranges and spurs, which fill eastern Siberia and terminate in Kamchatka.

Hydrography. The large rivers of the great plain of Russia have their sources in the moderate elevation of the Valdai Hills and flow away in all directions, to the Baltic, the Arctic Ocean, the Black Sea, and the Caspian. The vast extent of these lowlands favored the development of the largest river systems of Europe (the Danube alone excepted), and all these rivers have reached the advanced stage of mature adjustment to the land, have drained their ancient lakes, established their individuality, and deepened their channels in many cases sufficiently to extend navigation for light-draft vessels almost to their sources. The chief rivers may be classified according to their respective basins:

Basin of the Caspian Sea. The Volga (q.v.), the largest river in Europe, is continuously navigable for 1800 miles. Two of the Volga's tributaries are especially prominent in commerce. The Oka (q.v.), entering the river from the south at Nizhni Novgorod, waters the most fertile part of south central Russia along a course of 970 miles. The Kama (q.v.) drains the west slope of the Central Urals and its basin embraces an area larger than that of Great Britain. The Ural (q.v.) is shallow and chiefly noted for its prolific fisheries and its enormous fleets of small fishing boats.

Basin of the Sea of Azov. The Sea of Azov receives the Don, the third longest river of European Russia. This stream is greatly impaired for navigation by the irregularity of its flow. It is one of the great highways to the sea for the wheat of the eastern black-soil region. Its chief tributary is the Donetz (Little Don), navigable only in its lower course.

Basin of the Black Sea. The basin of the Dnieper, Russia's second longest river, is as large as France. Among its several important tributaries the Pripet is the most noteworthy. The Bug and the Dniester are the only navigable rivers west of the Dnieper.

Basin of the Baltic. The Vistula (q.v.) is Polish throughout its course in the domain of Russia, the great highway being used by the Poles to ship their cereals, timber, and other export products to the Prussian port of Danzig. Its principal tributary is the Northern Bug, which receives the Narev. The Düna or Western Dvina is another large river entering the Baltic. It is navigable almost from the heights of central Russia, where it rises, to the Gulf of Riga, into which it empties, but navigation is rendered difficult by rapids in one part of its course. Still another affluent of the Baltic is the Niemen, which takes the name of Memel on entering Prussia. The Narova carries the waters of Lake Peipus through a series of rapids to the Gulf of Finland, the great eastern arm of the Baltic; and the Neva, the outlet of Lake Ladoga, likewise emptying into the Gulf of Finland, though only 43 miles long, carries a volume of water equivalent to that of the Rhine and the Rhone united.

Basin of the Arctic. The most important rivers tributary to the Arctic Ocean are the Petchora, rising among the Northern Urals; the Northern Dvina, a mighty stream; the Dvina, emptying into the White Sea at Archangel; and the Onega, which drains Lake Bielo-Ozero to the White Sea.

Russia is extraordinarily rich in lakes in the northern section, especially that part which was invaded by the continental glacier. Finland and the northwestern provinces of Olonetz, Novgorod, St. Petersburg (Petrograd), and Pskov contain thousands of them. The largest of these lakes are Ladoga, with an area of more than 7000 square miles (about equal to that of Lake Ontario), Onega, about half as large, and Peipus. Most of the lakes throughout the whole region near the Baltic, where they are clustered, are connected with one another, and between them and the Arctic Ocean great expanses of moorland and swamp cover the low flat country. The lakes are a large element in the interior navigation. In the middle and south of European Russia there are few lakes excepting the small bodies of salt water on the sterile steppes of the southeast.

Climate and Soil. As Russia has a distinctly continental climate the winters are colder and the summers hotter than in western Europe in the same latitudes. The mean annual temperature, corrected for altitude, is a little lower as one goes from west to east; and this tendency holds nearly to the Pacific coast of Asia. There is naturally a great diversity of temperature as one proceeds from north to south, since Russia reaches into the Arctic zone and extends as far south as the latitude of north Italy. Frozen swamps skirt the north coasts and the vine and the olive thrive in the Crimea. All of the extreme north has severely cold weather or hard frosts from six to eight months in the year. The mean temperature of January at St. Petersburg is about 15° F. and of July about 64° F. Moscow, although much farther south than St. Petersburg, has a still more rigorous winter climate, owing to its inland location. The mean temperature of Odessa in summer and in winter is about the same as that of Boston. As the Russian plain is low, atmospheric disturbances are easily propagated over the entire

surface. No mountain ranges obstruct the cold north wind that sweeps from the Arctic Ocean to the Black Sea. The warm southern breezes are felt along the slopes of the Urals to the mouth of the Petchora and to Archangel. In the greater part of Russia proper the winters are long and severe and the summers are hot and sultry. This annual range increases eastward until at Verhoyansk in Siberian Russia the record range of temperature, 190°, has been recorded. In the Baltic provinces the winters are less severe than in the interior. The rainfall of European Russia is less than that of western Europe; but though the average precipitation is not over 20 inches a year, it is usually sufficient to insure good crops. The rainfall decreases from northwest to southeast, being smallest around the northern shores of the Caspian Sea. At St. Petersburg the annual precipitation is 18 inches, at Kazan 14, and at Astrakhan 4.8 inches. Nearly the whole of Russia is covered for months in winter with a thick mantle of snow, which contributes greatly to the fertility of the soil when the spring thaw sets in. Snow covers the ground at Odessa for 80 days and at Moscow 120 days. The rivers throughout the Empire freeze in winter. The coldest winds of the country are the moist north and the dry east winds.

The mixed clays and sands spread over the surface of nearly the entire northern half of the country in the glacial epoch form soils of fair average fertility, on which grow vast expanses of forests and large areas of flax, hemp, and cereals. The region of unsurpassed fertility, however, is the black-earth lands between the glacier-swept area and the steppes of the extreme south covered with deep, rich humus, now considerably impoverished, owing to many years of overcropping without fertilizers. The only unfertile region in the warmer areas is the salt steppes of the southeast, whose unproductivity is due more to the lack of rain than to the failure of plant food in the soil.

Flora. The five areas into which the vegetation of European Russia may be divided correspond roughly to so many climatic zones. In the north, along the edges of the Arctic Ocean, is a treeless land (tundra) covered with vast marshy moors, interrupted by bowlder-strewn plains, solidly frozen much of the year and producing mosses, lichens, and stunted shrubs. South of the tundra is the forest region, the third largest in the temperate zones, covering more than a third of Russia and embracing the north and a part of the central regions. The low forests forming the northern belt of the forest zone consist of birch, larch, silver fir, and some other hardy trees. They are succeeded by the high forests of splendid arboreal vegetation, mostly conifers, pine and fir, yielding great supplies of soft lumber and resin, turpentine, and tar. The conifers are succeeded by the great deciduous forests of central Russia (oak, maple, ash, and other trees), which form the southern belt of the forest zone. Agriculture has pushed northward into this zone and large areas of the flax, hemp, and rye fields occupy cleared lands. South of the forest zone and roughly bounded on the north by the Volga is Russia's greatest source of wealth, the black-earth region (*Tchornoziom*), the granary of Russia, with boundless fields of wheat and other cereals and with an abundance of grasses, but with no trees except such as have been set out as the fruit trees. This broad zone extends into Rumania on the west and passes around the Southern Urals into Siberia on the east. Still farther to the south, skirting the Black and Caspian seas, lie the steppes. The river Don, traversing the steppes, divides them into two parts of very different character. The western and well-watered half is a populous pastoral district, rich in nutritious grasses, on which many millions of cattle, horses, and sheep are fed and fattened; the eastern half, arid and inhabited only by wandering tribes of Kalmucks and Cossacks, is occupied by bleak plains, salt marshes and lakes, and sandy deserts. Bessarabia and the Crimea form a southern zone beyond the steppes, where maize thrives, the wines of Russia are produced, the olive ripens, and even cotton may be grown.

Fauna. The Arctic fox and polar bear, reindeer, and seals are found along the northern coasts or on the lands north of the Arctic circle. The forests formerly made Russia the great source of the fur and skin trade of Eurasia, but this commerce has been largely reduced by the overdestruction of fur animals, and Russia has for years given way to Siberia as the chief source of the Empire's fur trade. The fox, hare, brown and other bears, wolf, lynx, elk and other deer, wild boar, and glutton still abound in the forests. The beaver is now found only in the Government of Minsk. Most of the carnivora of the forest belt and also squirrels, foxes, and hares are found in the black-earth region, but the most distinctive animals of this agricultural area are the suslik and the baibak, which are the pests of the grain fields. Birds, most numerous in the forests, include the grouse, hazel hen, and partridge. The northwestern coast waters, warmed by the Atlantic drift, abound with cod, salmon, and other highly prized fish, and not only the coast but also the river fisheries are highly important. The most remarkable fishing grounds are situated near the mouths of the Don, Volga, and Ural, where herring, sheat fish (10 to 12 feet long; weight over 600 pounds), and sturgeon are caught in incredible numbers. Russia ranks third among the fish-producing countries of the world. About one-half of the enormous value of the Russian fisheries, amounting in 1911 to about 1,580,000,000 pounds, is yielded by the Caspian Sea.

Geology. Russia proper is a geological world apart from the rest of Europe. The endless variety of structure that is seen in western Europe gives place in Russia to almost horizontal layers, rising and falling only here and there in gentle undulations and covering hundreds of thousands of square miles, with nearly the same outward aspect and the same interior structure. The great zones of Paleozoic and Carboniferous rocks that cover Russia stretch away east and south to the very heart of Central Asia. Along the base of the Urals, between the Arctic and the steppes of the Caspian, extend the new red sandstones; the Permian formations (deriving their name from the Government of Perm) underlie a large part of Russia and rest conformable on the Carboniferous. Jurassic strata skirt the Permian southward and overlap them in the centre, forming a rough triangle which tapers from the Arctic to the Volga; and farther south chalk, Tertiary and more recent rocks skirt a granitic table-land that obliquely crosses the steppes in the extreme south; granites are also predominant in Finland. In the southwest of Poland the highlands contrast forcibly with the

great plain in the variety of their formations, which include chalks and Jurassic, Triassic, Carboniferous, and Devonian rocks, many minerals being mined in this hilly region. The Urals form geologically one system throughout of crystalline rocks. The gold of the Middle Urals is not sought in the granitic and serpentine rocks, but in the detritus that covers a large area at the base of the mountains. The mountains that cross the south side of the Crimea are of limestone and are mere fragments of the former ranges.

The whole of north Russia, with the exception of that portion of the plain along the Urals, was buried during the glacial period under the ice masses which invaded it from the Scandinavian peninsula, covering the land with morasses and erratic bowlders and leaving thousands of glacial lakes among the evidences of the various advances and retreats of the ice sheet. No region of Europe is more thickly sprinkled with erratic bowlders, many of enormous size, than Finland. In the southern part of Russia, on the other hand, no erratic bowlders are found to the south of Tula, Ryazan, and Kazan. All traces of the ancient glaciers disappear where the black-earth lands begin. The great region of salt lakes, marshes, and steppes which forms the southeastern steppe region of Russia shows the former extent of the Caspian.

Mineral Resources. In its mineral wealth Russia is one of the most richly endowed countries of Europe. Gold, silver, platinum, iron, copper, zinc, salt, and coal are the principal minerals worked. Defective means of communication and dearth of fuel have to some extent prevented the mining industry from attaining full development. The only regions where coal and iron in juxtaposition are largely mined are in the Donetz coal basin, in Poland, and in Siberia. Between 1887 and 1911 Russia quadrupled its production of iron and steel, of which 2,633,000 tons were produced in the latter year. Iron ore is found in various parts of Russia, both European and Asiatic. The largest mines are in southern Russia. Magnetic ironstone, the most valuable iron ore, is mined along a large part of the Urals.

The production of pig iron has increased from 2,200,000 tons in 1898 to 5,100,000 tons in 1913. Of the latter amount about 3,400,000 tons came from South Russian districts. Russia is making extraordinary progress in the production of iron and steel in every form, but the rolled-iron product is only about one-third as large as the steel output. Russia supplies about four-fifths of all the coal and pig iron consumed in the country and nearly all of the steel. Coal exists in much greater quantities than was formerly supposed. The best coal (partly anthracite) is obtained in South Russia in the Donetz basin, and these mines and those of Poland (in the Dombrovsk basin) yield about nine-tenths of the output. The mines of Poland are a continuation of the Silesian coal measures. The total annual yield has steadily increased (298,500 tons in 1860, 695,400 in 1870, 3,280,000 in 1880, 6,022,000 in 1890, 19,857,000 in 1904, and 35,000,000 in 1913), yet the supply falls short of the quantity required. The imports, chiefly from England, are large in spite of the tariff (9,510,000 tons in 1913). The chief sources of gold are Siberia and the Ural Mountains, about one-fourth of the product being obtained from auriferous veins. In 1912, 1,879,600 troy ounces of gold were produced, the Siberian mines alone yielding 1,014,157 ounces.

Copper (36,864 tons in 1912) comes chiefly from the Urals and Caucasus and to a lesser extent from Poland and Finland. About 90 per cent of the world's supply of platinum comes from the west side of the Urals (184,767 ounces in 1912). Zinc ore (averaging 65,074 long tons a year) is found in Poland. Mercury comes from Ekaterinoslav in South Russia and Caucasia. Russia is one of the richest salt-bearing countries of the world. The total product in 1911 was 2,013,000 tons, of which 42,000 tons was rock salt. The Donetz basin yields about 28 per cent, while Bakhmut (Government of Ekaterinoslav) comes second with 25 per cent. The lakes of the southeast steppes yield abundant salt and some of them are filled with a saturated solution of salt. Many lakes yield also soda. Iridium (solid), malachite (in large blocks), lapis lazuli, emeralds, diamonds, topazes, and onyxes are found in the Urals and amber on the Baltic coasts. Russia is deficient in building stone, but colossal blocks of granite occur in Finland. Porcelain clay and meerschaum are found in the Crimea. Marble is quarried in Finland and the Crimea. There are numerous chalybeate, sulphur, and saline springs. Peat moors on the Baltic coast and near Moscow are a source of fuel. The Baku petroleum fields in Transcaucasia, one of the greatest sources of mineral oil in the world, show signs of approaching exhaustion. The total production of crude oil in Russia fell from 78,536,655 barrels (of 42 gallons each) in 1904 to 60,935,482 barrels in 1913.

The world receives its chief supply of manganese from the Caucasian mines in the Government of Kutais, where there is a vast bedded deposit nearly 7 feet thick, lying practically level. The production in 1912 exceeded 100,000 tons, most of it coming from the Caucasus.

Agriculture. Russia is still preëminently an agricultural country. It pays for its imports with farm produce and four-fifths of the population subsist by husbandry. One-fifth of its surface, however—the tundras in the north and the salt steppes in the southeast—is entirely unfit for cultivation. There are about 15,000,000 acres of unproductive swamp lands in West Russia, but drainage works are gradually reclaiming them. About 39 per cent of the cultivable area is occupied by forests and about 16 per cent by pastures and meadows. About 900,000,000 acres are cultivable, of which 225,000,000 consist of the celebrated black earth, which is naturally the richest wheat land in the world. Owing to the extreme sparsity of Russia's population, however (about 20 inhabitants to the square mile in 1911), only about 215,000,000 acres are usually under crops.

The long winters and short, hot summers cause grain to ripen rapidly and compress into a few weeks an amount of work to which the farmers of western Europe can give as many months. Thus more men and horses are needed in a few seasonal weeks than can be employed at other periods of the year. The scanty rainfall also is in some years more meagre than in others, resulting in frequent periods of drought and famine, an evil greatly aggravated by the poverty of the peasants, who cannot carry reserve supplies of food. Farming is still conducted for the most part by primitive methods. Intensive agriculture is practically unknown in Russia.

The tenant system on the enormous estates of the great landowners results in wasteful and careless methods of tillage. There are few well-cultivated detached small farms, most of the peasantry living in village communes (*mirs*) and tilling scattered strips of land that are not their individual possession but are owned collectively by the commune, though the product belongs to the individual cultivator. (See MIR.) Private landownership among the peasantry is rapidly increasing, however. The European War which began in 1914 interrupted extensive and far-reaching land reforms in Russia, instituted under a law promulgated in 1906, looking to the readjustment and redistribution of land holdings among the peasantry. Agricultural development is still considerably hindered by the collective system of land tenure and the general poverty of the peasantry. Moreover, the central government not only fails to provide primary and technical instruction, but even obstructs the efforts in this direction of the zemstvos, as well as of private societies and individuals. However, economic conditions are surely if slowly forcing even agriculturally prodigal Russia to adopt modern methods in this field, as is shown by the increasing importation of agricultural machinery (mostly American) and the more general use of fertilizers. In spite of these drawbacks, however, Russia produces about two-thirds of the oats and half the rye of Europe and more barley and wheat than any other country save the United States, which, too, it surpasses in good years (1913). These cereal and fibre crops, together with potatoes, beetroot, and tobacco, are the great agricultural products of Russia.

Rye and winter wheat, the two leading cereals, had about two-thirds of the total acreage under cereal cultivation in 1913, the respective acreage being rye, 73,764,800, and wheat, 21,064,640. Wheat is the most important export crop, being grown chiefly in the black-earth region of South Russia. In good seasons Russia exports about 100,000,000 bushels (120,835,500 in 1913), being second only to the United States as a seller of this cereal and supplying three-fourths of the export wheat of Europe. The yield is on an average only about nine bushels to the acre, or only about two-thirds of that in the United States. Oats, barley, and rye are raised chiefly north of the great wheat area, and maize is grown in the southwest. Until 1877 Russia surpassed the United States in the production of cereals. The yields for the five principal cereals will appear from the following table:

CEREAL	Average 1908–12	1913
	Tons	*Tons*
Winter rye	21,050,000	23,882,500
Winter wheat	5,546,700	7,864,500
Spring wheat	10,375,800	13,977,500
Oats	13,248,400	15,740,500
Barley	9,150,000	12,124,000
Total	59,370,900	73,589,000

Rice is an increasing crop in the Caucasus, Siberia (Transbaikalia), and Turkestan and is now largely raised throughout the Empire. The crop of Transcaucasia alone amounts to about 121,300 tons a year and is shipped all over Russia through the Volga and Black Sea ports. The beet industry is one of the most important branches of agriculture and manufacture in Russia. Domestic beet sugar supplies the entire demand of the Empire and furnishes enormous quantities for export, Russia being the chief source of sugar for all the Black Sea territory and Persia. In 1912–13, 1,923,000 acres, mainly in the black-earth region and South Poland, were given to sugar-beet culture.

In 1909 Russia ranked second in the world for the area devoted to the cultivation of flax, which is not confined to any particular part of the Empire. The acreage under cultivation in 1910 was 3,887,259 for flax and 2,001,036 for hemp, yielding 630,000 tons and 123,752 tons respectively. The exports of flax alone amounted to 311,000 tons in 1912. Next to grain flax and hemp form the principal exports of Russia. The cotton-raising districts of the Empire are in Russian Turkestan and Transcaucasia, the largest supply coming from Ferghana, which exported some 306,952,000 pounds (including linter and old cotton) in 1912–13. The same season some of the other Central Asiatic cotton sections exported as follows: Tashkend, 28,889,600 pounds; Samarkand, 27,986,800 pounds; Bokhara, 72,224,000 pounds. The cultivation of potatoes has doubled in the past quarter of a century and the tubers are largely used in the manufacture of spirits. Viticulture has made much progress in the southwest and south (Bessarabia, Kherson, Podolia, the Crimea, and Transcaucasia). Bessarabia has about 200,000 acres of vineyards. The best red wines now compare favorably with good French wines and are cheaper, and the champagnes of Odessa compete successfully in Russia with the French vintage.

Forests. Wood is used in Russia on a most wasteful scale both for industrial purposes and as fuel. Though the wealth of European Russia in timber is surpassed only by the forests of Canada and the United States, and the forests of the Empire probably surpass those of any other country in extent, the science of forestry is but little known. In certain northern sections the superabundant woods are utilized only to produce potash, resin, tar, and turpentine, while the south suffers for want of timber. Exclusive of Siberia Russia has 549,800,000 acres under forest. The forests in Russia proper cover an area of about 474,000,000 acres; in Finland, 50,500,000; in Poland, 6,700,000; in the Caucasus, 18,700,000. The exportation of timber of all kinds from Russia in 1913 totaled 460,599,000 poods and was valued at over $86,000,000.

Stock Raising. In its live-stock interest Russia naturally surpasses every other country of Europe. Nearly half the horses of the Continent are raised in Russia. It leads all the other countries in cattle, sheep, and goats, and is inferior only to Germany in the number of hogs. The live-stock-raising industry contributes over $90,000,000 worth annually to Russia's export trade, besides supplying the great home demand. In proportion to the population, however, Russia's wealth in live stock is not remarkable, and has been decreasing owing to the frequently recurring famines and the deterioration of the condition of the peasantry. The industry is largest on the broad southwestern steppe, where the animals spend the whole year in the open air. Farther north, however, animals must be fed under cover for 100 to 200 days in the year. The breeding of domestic animals is not skillfully conducted except as to horses, the 3000 stud farms by which the government is promot-

ing this industry having been so successful that Russia now has not only the most but also the best horses in Europe. Meat, tallow, and hides are the main objects of cattle raising, dairy interests being neglected. Next to Great Britain Russia yields the largest quantity of wool in Europe, nearly all of it being utilized in the Russian wool factories. Bristles are the chief article of hog products exported. Camels are bred in the southeast, while reindeer form the wealth of the Laplanders and of the inhabitants of northeast Siberia. The number of the principal domestic animals in the Empire (exclusive of Finland) in 1912 was 169,639,000, consisting of 33,169,000 horses, 48,896,000 cattle, 74,066,000 sheep and goats, and 13,508,000 hogs. Perhaps in no other country are fish so important in domestic economy as in Russia. On account of the numerous fast days fish are an indispensable article of diet, and though the value of the home fisheries is very great (over $75,000,000 in 1911), large imports are necessary, and isinglass and caviar are the only fishery produce exported.

Manufactures. The government protects home industries by imposing a very high tariff on imports, averaging about 35 per cent of their value. Until about 1820 Russia was almost completely dependent upon other nations for manufactured goods. Manufactures have wonderfully developed under the protective tariff, but the hardships of excessive protection have forced the government to abolish some of the import duties, notably those on iron and steel. Industries have been greatly promoted by the variety of raw material which the Empire affords, as well as by the abundance of capital (much of it from foreign countries, attracted into the Empire by high protection) and the large dividends which enterprises in Russia have yielded. Trained talent, highly skilled labor, and modern machinery from foreign countries are largely employed. The superintendents, chemists, engineers, and mechanics in the factories are generally foreigners.

Nevertheless Russia's industrial system still lags considerably behind those of more western countries, but modern ways and means are gradually exerting their influence upon Russia in this as in other respects. The larger part of the Russian factories are very small and a far greater number of them are located in the country than is the case in either England or the United States. The majority of the workpeople are engaged in agriculture in summer, but devote the long winters to various manufactures, either in their own homes or in towns, whither they repair for employment. Such large cities as Moscow, St. Petersburg (Petrograd), Warsaw, Lodz, and Bialostok have a permanent manufacturing population. Many other cities attract to their factories in winter thousands of people from the farms, and even most of the permanent factory hands are former peasants. The manufacture of linen, woolen goods, leather, house utensils, earthenware, hats, and many other articles is still very largely in the hands of peasant workers, who produce their wares in their own homes or village shops. Their work is highly skilled, for the division of labor is often very minute. There are more than 100,000 of these small factories and home workshops. The number of factories and workshops under government inspection in 1913 exceeded 17,356 and the number of hands employed 2,151,191, with a total product valued at over 1,451,554,000 rubles. The following table shows the number of companies engaged in various industries and the capital employed therein in 1911.

INDUSTRIES	Number	Capital
Textiles	17	$11,116,300
Paper and printing	4	3,038,500
Metal works	13	9,419,300
Foodstuffs	26	12,030,400
Chemicals	6	1,776,700
Mineral products	6	2,267,500
Mining	28	27,325,400
Animal products	7	1,442,000
Distributive enterprises	33	16,455,800
Sanitation, etc.	15	4,345,600
Miscellaneous	6	2,047,100
Total	161	$91,264,600

The output of the textile industries is of greater value than that of any other branch of manufacture. Only imported cotton goods were worn before 1840, but by 1913 Russia, exclusive of Finland, had 137 cotton factories, with 8,987,911 spindles, a capital invested of $192,608,000 and an output surpassed only by those of Great Britain and the United States. The product of the cotton industry was valued in 1912 at $667,389,000. The product not only meets almost the entire domestic demand, but there is also a surplus for export to Asia and Rumania. Russian cotton goods cannot compete, however, in the markets of central and western Europe, neither is there any market in Russia for any western cotton products excepting the finer fabrics, which are not yet produced at home. The chief cotton-manufacturing centres are the Moscow district, with large dyeing and printing works, Vladimir, Ivanovo, Tver, Shuya, St. Petersburg (Petrograd), Warsaw, and Lodz, which last produces about seven-eighths of all the cotton cloth made in Poland and about one-tenth of the cotton yarn spun in Russia. The woolen industry also has greatly expanded, especially in the manufacture of cloth, the Moscow district leading. The value of the flax and hempen goods, produced chiefly in the households and in the factories of the central governments, averages about $125,000,000 a year. The silk industry, centred almost wholly in the Moscow district, consumes over $6,000,000 of raw silk and yarn a year, purchased in Italy, China, and Persia. Up to 1914 the distillation of spirits ranked next to textiles in value of output, the consumption of spirits having been nearly two gallons per capita a year. In 1913 there were 2974 distilleries in the entire Empire, producing 133,230,000 gallons of alcohol. The brewing business is also large. Esthonia, south of the Gulf of Finland, is the largest centre of production. The government, with a view to increasing the revenue, had a monopoly of the production and sale of spirituous beverages (not including wine and beer) throughout European Russia.

The native metal industry is of great importance, though it has suffered greatly from defective communications and lack of fuel. The manufactories of machinery are located in the central and particularly the southern industrial region. Many factories supply agricultural machines and implements, the value of the output having risen from $1,112,500 in 1867 to nearly $5,000,000 in 1897 and to about $30,000,000 in 1912. But rapidly as this industry has grown in Russia, the domestic demand necessitates

considerable importations ($43,026,000 worth in 1913) from the United States, England, and Germany. Still the metal industries employ a vast number of workmen (the 42 companies engaged in these industries in 1913 employed a capital of $40,237,000). The railroads are supplied with homemade rails. Russia's sugar mills and refineries are confined to Poland (chiefly the Warsaw region) and Little Russia (chiefly the Government of Kiev). The principal tobacco-growing centres in Russia are Transcaucasia, Russian Turkestan, and Little Russia. The total amount of smoking tobacco, cigars, and cigarettes manufactured rose from 13,037 tons in 1883 to 22,580 tons in 1912. The number of cigarettes manufactured had increased from 3,500,000,000 in 1883 to 22,500,000,000 in 1912. Russian leather manufactures, long famous, are carried on in all parts of the Empire. The well-known Russia leather is made chiefly in the centre and north, Turkey leather in the east and south. Ships are built at all the seaports and on the Volga, Oka, and Kama. Chemical factories are found all over the Empire, but chiefly in the Government of Moscow. St. Petersburg's manufactures of malachite are famous and the glass and porcelain made in the Imperial factory at the capital are of a very high class. The production of these articles and also its mills and shops and buying their cotton and other raw materials; but to the western nations it is an agricultural state, sending them its grain, flax, and hemp and buying their manufactures. The volume of foreign trade is still small considering the vast resources of European Russia and its enormous population. Though it is more populous than the United States, its general merchandise trade with foreign countries is less than that of the small state of Belgium. A large part of the foreign trade is in the hands of English, German, French, and other foreigners established at the seaports. The following table is a statement of the average annual trade of European Russia across the European, Finnish, Black Sea, and Caucasian frontiers in millions of dollars.

CLASS	1900–04	1905–09	1913
Imports	$327.8	$426.6	$629.0
Exports	452.0	587.7	732.0

The trade through the Asiatic frontier in 1913 was 134.5 millions of dollars, of which 84.5 were exports. The trade of Russia with the principal countries of the Eastern Hemisphere in 1900 and 1913 was:

COUNTRY	1900 Imports from	1913 Imports from	1900 Exports to	1913 Exports to
Germany	$111,614,405	$321,378,000	$96,632,025	$256,318,500
United Kingdom	65,450,320	85,176,000	74,971,640	133,432,000
France	16,295,595	28,007,500	29,586,750	50,428,500
Austria-Hungary	13,886,460	17,341,500	13,523,900	32,628,000
Turkey	3,725,850	8,469,000	9,404,415	17,230,000
China	8,339,395	*7,630,000	589,675	280,000
Finland	10,308,240	25,482,000	21,132,510	27,646,000

* Exclusive of trade across Asiatic frontier.

of paper, furniture, and fancy goods falls below the domestic demand.

Commerce. It is not easy in countries like Russia, where the means of communication are poor, for merchants to inspect all the varieties of goods they may wish to sell unless great collections of goods are brought together at fixed times and at central places. This accounts for the prevalence of fairs in Russia, where they constitute a regular and indispensable mercantile institution. No fewer than 16,000 fairs (87 per cent agricultural) are held annually in the Russian Empire. Their total turnover exceeds 1,000,000,000 rubles. The seven principal fairs are those of Moscow, Kharkov, Poltava (where horses, sheep, and wool are dealt in on a large scale), Yelizavetgrad, Kursk, Irbit, and Nizhni Novgorod (q.v.).

The trade relations of Russia with the countries west and east of it vary greatly. To Turkestan and all Asiatic countries Russia is a manufacturing state, sending to them the product of

The leading imports are raw and half-manufactured articles (cotton, metals, coal, wool, silk, leather, chemicals, etc.), manufactured goods (machinery, metal goods, some textiles, etc.), articles of food (tea, beverages, fruits, coffee, tobacco). Among other exports are cereals and flour, timber, naphtha, flax and hemp, oil cake, oil grains, furs, hides and skins. The following table shows the growth of imports and exports from 1908 to 1913.

CLASS	Foodstuffs	Raw and semi-manufactured products	Live stock	Manufactured products
Imports 1908	$65,046,000	$211,617,000	$762,200	$114,197,600
Imports 1913	81,507,000	300,453,000	1,549,500	226,722,500
Exports 1908	269,053,000	190,920,200	16,732,000	13,760,800
Exports 1913	403,600,500	275,111,500	16,492,500	15,223,000

In 1901 the trade with the United States consisted of $16,168,000 in imports and $14,062,000 in exports. In 1914 it was $31,203,000 and $23,320,000 respectively. These figures are as given by the United States government, but differ from those of Russian reports, owing to the fact that much of the trade is indirect, i.e., consigned to ports of other countries in the first place. The trade between the two countries is probably greater than the figures on either side indicate. The principal American exports to Russia are cotton, copper, agricultural imple-

ments, and machinery. The principal Russian exports to the United States are hides and skins and wool. Finland forms a customs district by itself and its trade is not included in the trade statistics of European Russia.

Transportation and Communication. Russian wagon roads are generally in a very bad condition in spring and autumn. In winter, when the whole plain of Russia is covered with snow, sledging is universal and the land transport of goods is facilitated. About one-third the freight of the Russian Empire is transported by water. Water transportation is still much the cheapest means of communication, in spite of the fact that Russia's rivers and canals are closed by ice from three to seven months of the year and the southern rivers, notably the Don, are much reduced in depth by the dryness of the summer. There are in all about 178,580 miles of navigable rivers, lakes, and canals in the Russian Empire, but only one-third of them (about 32 per cent) are suitable for regular steamers. Over 1700 steamers ply on the Volga and its tributaries. There is direct water connection by river and canal between the Caspian Sea and the Arctic Ocean, between the Caspian Sea and the Baltic, and between the Black Sea and the Baltic. The mileage of Russia's railroads has increased enormously since the last quarter of the nineteenth century, having grown from 13,023 miles in 1877 to about 50,000 miles in 1914. About two-thirds of this is controlled by the government; the rest is owned by private companies (seven in 1914). Of this vast trackage over 36,000 miles are in European Russia and about 11,000 in Asiatic Russia. In 1914 the Russian railroads transported about 250,000,000 passengers and 233,315,016 tons of freight.

The chief seaports are on the Baltic and Black seas. Excepting Odessa, Sebastopol, and Novorossisk on the Black Sea and Hangö on the Baltic, they are blocked by ice from two to five months, but ice breakers are mitigating this inconvenience. The Black Sea ports are the main outlets for agricultural produce. Most of the sea trade with north and central Europe and the United States is through the Baltic ports. Odessa has the largest shipping trade, is the chief depot for the produce of South Russia (wheat, tallow, wool, and linseed), and has regular connection with all Black Sea ports, the chief Mediterranean and Atlantic ports of Europe, and the Pacific port of Vladivostok. Taganrog, Rostov, Berdiansk, and Mariupol are grain ports on the Sea of Azov, and Astrakhan on the Volga delta is the central point of the Caspian Sea trade. St. Petersburg is the leading port of the Baltic. Riga is the most important shipping point in western Russia for flax, hemp, and timber. Archangel, on the White Sea, has an important export trade in timber, tar, pitch, grain, and furs. Abo, Hangö, Helsingfors, Reval, and Libau are also important ports. The coasting trade is very large and since January, 1900, only vessels sailing under the Russian flag can engage in it. The mercantile marine of Russia in 1914 consisted of 3700 vessels, with a total of 783,000 net registered tons; of these 1044 were steamers (total tonnage 513,000) and 2597 sailing vessels (total tonnage 257,000). The shipbuilding activity was very promising before the European War, when the Admiralty passed a bill to spend more than 500,000,000 rubles on naval construction. At the same time the government had decided to extend the duty-free importation of ocean steamers until 1928.

Banking. The Bank of Russia is the state bank and also a commercial bank. In 1914 it had 134 branches and 780 treasuries throughout the Empire. It issues the paper currency of Russia as necessity occurs. If the amount of the paper currency does not exceed 600,000,000 rubles, the bank guarantees it by half of that sum in gold. Every issue above 600,000,000 rubles must be guaranteed to the full amount in gold deposited in the bank. The total amount of the paper currency on March 29, 1915, was 3,260,000,000 rubles and the guarantee fund in gold to cover the currency was 1,552,052,000 rubles.

The number of state, municipal, and postal savings banks on Jan. 14, 1913, was 8005; depositors, 8,456,804; deposits, 1,594,800,000 rubles. The state banks for mortgage loans to the nobility had outstanding loans amounting to 1,232,885,000 rubles on Jan. 14, 1912. The land bank for the purchase of land by the peasants made loans in 1911 to village communities, associations, and separate individuals with which were bought 37,732,000 acres valued at 1,802,346,000 rubles, of which 1,473,276,000 rubles were lent by the bank. The 53 mortgage banks on Jan. 14, 1912, had 3,057,971,948 rubles in loans on landed estates belonging to 377,526 private proprietors and covering 157,131,406 acres.

Government. The government of Russia, originally an Eastern and despotic state, is slowly taking on a European form. Owing to the great changes which began in 1905 and which have not as yet taken definite form, it is difficult to characterize the present governmental system of Russia. At present it can be best described as a decaying absolutism destined to assume a constitutional form. The account which follows is descriptive of conditions up to the issue of the manifesto of Aug. 19, 1905. For present conditions, see the section on *History*. With the enactment of the New Fundamental Laws in 1906 a beginning of constitutional government may be said to have been made. The government of Russia is an absolute hereditary monarchy. The whole legislative, executive, and judicial power is vested in the Czar alone. He bears the title of Autocrat of All the Russias and, as the title indicates, there are no legal limitations whatever upon his authority. There are, however, certain rules for the most part relating to the law of succession which the Czar regards as binding upon himself. He exercises the legislative and administrative power through the aid of certain great councils of state, composed of functionaries appointed by himself and responsible to him alone for their conduct. The first of these bodies is the Council of the Empire, a purely consultative assembly established as early as 1801 and consisting of 98 members appointed by the Czar and 98 other members elected for nine years. The second is the Duma, consisting of 442 members elected for five years. Its function is also wholly consultative, it being devoid of any legislative or executive rights.

A great body of state through which the Emperor governs is the Senate, which was created by Peter the Great in 1711 and reorganized in 1802. It is divided into six departments or sections. Two of these act as courts of cassation. Their members, like the other Senators, are appointed by the Emperor, but, by reason of their judicial functions, are regarded as ir-

removable. Another section is charged with the promulgation and execution of the laws. Other sections divide among themselves the business of supervising the collection of the taxes, the use of the public funds, the preservation of the archives, the appointment of officers, and the maintenance of order. As a whole the Senate is the final supreme court of appeal in civil and criminal cases for the Empire, a supreme administrative court, and a disciplinary tribunal for the trial of public officers. Another administrative body is the Holy Synod, charged with the supervision of ecclesiastical affairs. It is composed mostly of ecclesiastics, viz., the three metropolitans of St. Petersburg (Petrograd), Moscow, and Kiev, the archbishops of Georgia (Caucasus) and of Poland, and several bishops. There is one lay functionary, with the title of Procurator General, who is also a member. All the members are appointed by the Emperor. The Synod cannot introduce innovations into the Church, but it exercises control over the Church in matters of discipline and superintends its higher administration. Its decisions are made in the name of the Emperor and have no force until approved by him. Still another great organ of Imperial administration is the Council of Ministers, which dates from the year 1802. The ministers, 13 in number, are appointed by the Emperor and are responsible to him alone. Besides the ministry the Czar has his private chancelleries, charged mainly with the administration of public charities and certain branches of public education, the examination and publication of the laws, and the control of certain branches of the police service.

Up to 1911 special arrangements existed for the government of Poland and Finland, but since then Finland has been governed as part of the Russian Empire. In Poland the chief representative, or lieutenant, of the Emperor is the Governor-General, who is assisted by a council. He is also the president of a deliberative assembly composed of permanent and temporary members all appointed by the Emperor. For administrative purposes the whole Russian Empire is divided into governments (*gubernii*), provinces (*oblasti*), and territories (*okrugi*). In 1915 there were 98 governments, 21 provinces, and 2 territories. For a list of these see the table following under *Population*. For the government of Finland, see FINLAND.

The provinces altogether number 21, all but one of which (the Don Cossack) are in Asia and the Caucasus. Several of the governments are united under the rule of a governor-general. In each single government there are a deliberative assembly and a civil governor, while in a number there is also a military governor. Each government is divided into districts numbering from 2 to 15. In the case of Great Russian and Little Russian governments (40 in all since 1911), every district has a deliberative assembly (*Zemstvo*), elected by three classes of voters, viz., proprietors, burghers, and inhabitants of the rural communes who are 25 years of age and possess not less than 15,000 rubles' worth of property or who are engaged in businesses of some importance. District zemstvos consist of from 60 to 65 members and meet annually—oftener if special business requires and the Governor (*Gúbernátor*) permits—for from 10 to 20 days. No compensation is allowed these officials, save as they become members of a standing committee. Their duties include the construction of public works, administration of charity, public health, public education, and other matters of local concern. All their proceedings, however, are subject to the approval of the governor of the given government, who has the right to veto all resolutions. The administration of the municipalities is vested in a mayor (*Golova*) and an elected council or deliberative assembly (*Duma*). The members of the council are chosen by property owners, who are divided into three classes, each class choosing an equal number of members. Its duties include the maintenance of the public health and safety, the care of markets, ports, charitable institutions, hospitals, libraries, etc., and the general supervision of municipal affairs. A law of 1894 has materially reduced the power of the municipal government and placed it largely under the control of the Imperial government.

The lowest administrative unit is the commune, of which there are over 107,000 in European Russia. The chief executive officer of the commune is the *Starosta*. Other officers are the tax collector, the treasurer, school trustees, hospital inspectors, etc. They are elected by the communal assembly (see MIR). This is a popular meeting of all the householders in the commune, which has many elements in common with the New England town meeting. Usually a majority vote is sufficient to validate any action of the *mir*, though in some cases a two-thirds vote is required. The *Starosta* serves as moderator of the assembly. He supervises the execution of its resolutions, has control of the police, and has charge of the disbursement of the communal funds. Several communes grouped together form a canton or *volost*, of which there are over 10,000 in European Russia. Each is presided over by an elder (*Starshina*) elected by the cantonal assembly, composed of representatives of the communes on the basis of 1 member to every 10 families. It discharges the same duty for the canton that the *mir* does for the commune. It meets in the most important or the most central village of the commune. The *Starshina* is assisted by a council. His term of service is three years and is obligatory unless the appointee is 60 years of age or has serious infirmities. Another cantonal institution is a court consisting of from 4 to 12 judges elected by the cantonal assembly. It has jurisdiction of misdemeanors and disputes among the peasants concerning property where amounts not exceeding 300 rubles are involved. St. Petersburg (q.v., officially Petrograd), the capital of the Russian Empire, is governed quite differently, under a law enacted in 1903.

Finance. The revenue and expenditure of the Empire are classed under the heads of ordinary and extraordinary revenue and expenditure. The estimated revenue and expenditure for the year 1915 were: ordinary, 3,080,108,314 and 3,078,-814,461 rubles; extraordinary, 154,200,100 and 155,493,953 rubles.

The ordinary revenues were in nine classifications. The estimates under each heading in 1915 are here given: 1. Direct taxes, 342,465,270 rubles (from taxes on land, forests, and capital, and sale of trade licenses). 2. Indirect taxes, 695,184,300 (from customs duties and imposts on spirits, tobacco, sugar, matches, and naphtha). 3. Duties, 508,913,532 (from stamp duties, passports, railroad taxes, etc.). 4. State monopolies, 324,172,050 (mining, mint, posts, telegraphs and telephones, and sale of spirits).

5. State domains, 1,068,235,937 (rentals from crownlands, forests, and mines, net earnings of state railroads, interest on crown capital, etc.). 6. Sales of domains, 1,826,790. 7. Redemption of land, 1,864,863 (payments made on land purchased by liberated serfs and crown peasants). 8. Reimbursement of Treasury expenses, 123,333,152. 9. Miscellaneous, 15,112,420 (payments on railroad and crown debts, aid from municipalities, military contribution, etc.). The extraordinary revenue was to be derived from interest on the perpetual deposits in the Bank of Russia (1,500,000 rubles) and prospective state loans (144,700,100) and reimbursement of advances made to Alimentation Fund (8,000,000), making a grand total of 3,234,308,414 rubles.

The estimated expenditures, ordinary and extraordinary, for 1915 were as follows:

Ordinary.—State debt, 439,706,598 rubles; higher institutions of state, 8,912,010; Holy Synod, 49,189,350. Ministries: Imperial house, 16,359,595; foreign affairs, 7,790,288; war, 598,714,153; navy, 204,879,339; finances, 355,328,092; commerce and industry, 57,429,996; land organization and agriculture, 146,038,330; interior, 208,701,120; public instruction, 146,652,371; ways of communication, 710,587,924; justice, 101,691,657; state's control, 12,996,038; state's studs, 3,837,600; unforeseen expenditure, 10,000,000. Total ordinary, 3,078,814,461.

Extraordinary.—Expenditures of the War Ministry, 78,328,000 rubles; building of new railways, 65,710,577; construction and improvement of ports, 9,384,200; subsidies to railways, 1,071,176. Grand total for expenditures, 3,234,308,414 rubles. The average annual increase of expenditures was 104,000,000 rubles for the five years preceding 1913, while for 1914 an increase of 307,000,000 was found necessary. The total proposed budget for 1915 included 34,100,000 rubles from the increased price of what spirits and vodka will still be sold after the closing of the government's monopoly spirit shops in 1915, which alone yielded a revenue of 936,217,500 rubles in 1914.

Weights, Measures, and Money. The unit of coinage is the silver ruble of 100 kopeks, of the average value of 51.5 cents. The imperial and half imperial are gold coins of 15 and 7.5 rubles which are rather scarce. Besides these gold pieces of 10 and 5 rubles are coined. The silver coins include pieces of 1 ruble and of 50, 25, 20, 10, and 5 kopeks. In copper there are denominations as low as half and quarter kopeks. Legal-tender credit notes (500, 100, 25, 10, 5, and 3 rubles and 1 ruble) are also issued. The unit of measurement is the arshin (28 inches). The verst equals 3500 feet, or two thirds of a statute mile. The unit of weight is the pound (funt), equaling nine-tenths of a pound avoirdupois. The pood is equivalent to 40 Russian or 36 American pounds. The metre, kilogram, and their subdivisions may legally be used.

Navy. The Russian navy was first organized by Peter the Great. As the Russians were not naturally a seafaring people, the navy did not until comparatively recent times become very strong. During the early part of the nineteenth century it was probably the third in Europe as regards number and power of its vessels, but from the time of the Crimean War it continued to fall behind until the Turkish, Italian, and German navies had surpassed it. In 1884 the rebuilding of the fleet began and continued quite steadily up to the time of the Japanese War. In 1890 it was fourth in the aggregate power of its ships, and in 1895 it was inferior only to the fleets of Great Britain and France.

From the disasters of the Japanese War the Russian navy was slow in recovering, but the building programme was an extensive one, and the naval operations in the Baltic during the Great War were highly creditable to the new organization and personnel.

Reorganization of the navy began in 1911. At that time four 23,000-ton battleships were building at Petrograd. Three more of 22,500 tons were laid down in private yards on the Black Sea during 1911, and four battle cruisers of 32,500 tons were commenced at Petrograd in December, 1912. The full programme, to be completed by Jan. 1, 1930, was set at 24 battleships, 12 battle cruisers, 24 other cruisers, 108 destroyers and torpedo boats, and 36 submarines. All vessels under construction were included as a part of the programme. A full list of all vessels built and building is given in the table under NAVIES.

The Russian navy is under the direction of the Minister of Marine (an admiral or vice admiral), the Assistant Minister of Marine, the Chief of Staff, the Chief of the General Staff, the Director of Naval Construction, and the Admiralty Council (whose members are admirals, vice admirals, or rear admirals). The personnel on Jan. 1, 1914, consisted of 8 admirals, 18 vice admirals, 28 rear admirals, 160 captains and commanders, 1321 other line officers, 157 midshipmen at sea, 508 engineer officers, 287 medical officers, 535 naval constructors and assistants, 85 chaplains, and 47,318 enlisted men. The enlisted force, recruited by conscription, was to have been increased to 59,525 during 1914, but the war upset all plans, and the numbers of officers and men actually in service in 1916 is unknown, though they are doubtless much greater than the figures given.

For more than half a century the Black Sea has been by treaty and general European agreement a *mare clausum* and no war vessels have been allowed to pass through the Bosporus. Moreover, the character of the Dardanelles and Bosporus renders it easy for Turkey to prevent passage at any time. This has caused the Black Sea fleet to be a separate part of the Russian naval establishment.

The principal navy yards are the Baltic Works, the New Admiralty Yard, and Galernii Island Yard—all three at Petrograd and used chiefly for building warships and machinery—a large repair and equipment yard at Kronstadt, a similar yard at Sebastopol, and a smaller one at Vladivostok. The less important yards are at Reval, Libau, and Helsingfors.

The Russian navy in 1915 consisted of some 200 vessels of all types, aggregating 407,580 tons, and some 44 vessels, with a total tonnage of 252,204 tons, were building. The vessels in service consisted of 5 battleships of the dreadnought type, 114,500 tons; 7 battle cruisers, 99,578 tons; 1 coast-defense ship, 8880 tons; 5 armored cruisers, 56,155 tons; 5 fast cruisers, 32,605 tons; 2 other cruisers, 13,462 tons; 118 destroyers, 66,718 tons; 19 torpedo boats, 2682 tons; 40 submarines, 13,000 tons. The vessels building included 2 battleships of the dreadnought type, 45,000 tons; 4 battleships of the predreadnought type, 130,000 tons; 6 fast cruisers, 42,510 tons; 17 destroyers, 23,694 tons;

15 submarines, 11,000 tons. These figures must be considered as approximate, especially in connection with destroyers and submarines, for which reliable information was not available during the war. See WAR IN EUROPE.

Army. The vast extent of Russia's territory, the internal condition of the nation, and the character of the countries adjoining her make it necessary even under peace conditions for her to maintain what amounts to three separate armies, viz., the Army of European Russia, the Army of the Caucasus, and the Asiatic Army, concerning whose strength either in peace or in war there is little reliable information.

The Cossack troops of southeast European Russia are organized into different categories. The Cossack is liable to service for life, commencing at the age of 19. He is trained for two years at home, then at 21 joins the active district regiment, where he serves four years in the first category, then to the second and third categories for four years each, then five years in the reserve. The conditions of service under peace conditions for the other troops of Russia vary slightly, but in general are as follows: first line or active army, 3 years for infantry and artillery, 4 years for other arms; first reserve (*zapas*), 15 or 14 years, with two six-weeks training periods; opolchénié or second reserve, 5 years, which gives a total liability of 23 years, commencing at the age of 20 and ending at the completion of the forty-third year. The opolchĕnié is divided into two bans. The first ban is composed principally of trained men and surplus young men, forming a supplementary reserve for the active army. A part of this ban is organized in peace for home defense in war, into 40 divisions, each of 16 battalions, 2 batteries, and a cavalry regiment. The second ban corresponds to the unorganized militia in the United States and is the final reserve or levy en masse. Service is universal and compulsory.

Higher Organization.—The country is divided into districts, each district having a commander who presumably commands the forces mobilized in the district in war. Before the Great War of 1914 there were altogether 37 army corps. The normal army corps consists of 2 infantry divisions, an engineer battalion, and in some cases a cavalry division. The division consists of 2 infantry brigades of 2 regiments of 4 battalions, an artillery brigade of 6 or 8 batteries, an engineer battalion, and 2 or 3 squadrons of cavalry. The cavalry divisions ordinarily consist of 2 brigades of 2 regiments each, and 2 horse artillery batteries. Field batteries have 8 guns, horse batteries 6. The war strength of the army corps is about 36,000; with a cavalry division, about 40,000.

Infantry.—Typical formations are as follows: 4 companies to the battalion, 4 battalions to the regiment, 2 regiments to the brigade, 2 brigades to the division. There are, however, regiments with 1, 2, or 3 battalions and battalions with 5 or more companies. Of fortress troops there are 44 infantry battalions. The infantry battalion in peace numbers about 500 officers and men; in war, about 1000. At the outbreak of the Great War in 1914 the army of European Russia alone consisted of 1038 battalions of infantry, 642 squadrons of cavalry, and 497 batteries. In European Russia and in Finland rifle brigades of 4 regiments (8 battalions) are organized as separate units not included in army corps. They have their own artillery (3 batteries) and are supplied the best recruits.

Artillery.—The artillery is divided between the artillery of the active army, the fortress troops, and the reserve categories above mentioned. The batteries of the fortress troops are further divided into sortie batteries, siege (including heavy field batteries) batteries, and fortress batteries. Of the latter class some are serving as coast artillery.

Field Artillery.—Batteries contain 8 guns, commanded by a lieutenant colonel. As the battery is so organized as to be divisible into two self-sustaining half batteries, it may be said that the Russian battery is in reality a battalion. Two or three batteries form a group (regiment) and two or three groups a brigade, commanded by a general officer. As a rule there are 6 batteries (48 guns) in one of the divisions of a corps and 8 batteries (64 guns) in the other division. Horse artillery batteries have 6 guns. Battery strength in peace, 6 officers and 164 men; in war, 6 officers and 227 men.

Siege (Heavy Field) Artillery.—58 batteries. Peace strength, 3 officers and 119 men; war strength, 3 officers and 238 men.

Fortress Artillery.—264 companies, of which 116 are serving at coast artillery fortifications. Peace strength, 3 officers and 119 men per company; war strength, 3 officers and 238 men.

Cavalry.—The regiment contains from 2 to 6 squadrons, 6 being the most frequent number. In the European Army there were 20 complete cavalry divisions; in the Caucasus 4; in the Asiatic Army the equivalent of 6; total estimated, 30. Besides these divisions there are several independent cavalry brigades. The strength of the squadron varies greatly, the average being 5 officers and 163 men, at war strength.

Technical Troops.—In the active army there are 226 companies; in the fortress troops 36 companies. Peace strength, 4 officers and 120 men per company; war strength, 4 officers and 200 men. In the active army the technical troops are usually organized into battalions of 4 companies each, the battalions into brigades. There are three aërial battalions, 11 independent companies, and a special training section.

Sanitary Troops.—Sanitary officers have civil but not military rank. Total peace strength of surgeons before the Great War, 3500; enlisted strength not known.

Total Peace Strength.—Estimated at 1,300,000 of all ranks.

Total War Strength.—The total number of trained men, considering only the field armies of European Russia and the Caucasus, the first category reserve divisions, and the second category regiments of the Don and Caucasian Cossacks, amounts to about 7,000,000.

It is difficult to estimate the number of troops Russia can mobilize in any one theatre of war. It must be remembered, however, that in the war with Japan there were mobilized and in the field at the end of the war 1,000,000 Russian troops and that the theatre of war was only to be reached by a single railway several thousands of miles in length. In European Russia the bulk of the peace army was stationed west of a line drawn north and south through Moscow, consequently recruits and reservists drawn for these corps from districts east of that line have a long distance to go to join their corps. It must be remembered also that rail-

roads to the European frontier are few in comparison with those of Germany to the same frontier. These facts in part account for the slow mobilization of Russia as compared with France and Germany in the Great War of 1914–16.

Arms.—Infantry, a magazine rifle (five cartridges), calibre .29 inch, muzzle velocity 2035 foot seconds, range 2500 yards. Cavalry and Cossacks the same with the exception of a shorter barrel. Field artillery, quick-fire shielded gun, firing a projectile of 13½ pounds with a muzzle velocity of 1950 foot seconds.

See MILITARY GEOGRAPHY; WAR IN EUROPE.

Population. The population of the Russian Empire, including Finland, Khiva, and Bokhara (qq.v.), according to the census of 1897 was 128,195,600. The growth of population has been remarkably rapid, but since the World War has shown a decrease. The population in 1722 was about 14,000,000; in 1815, 45,000,000; in 1851, 68,000,000; and in 1912 it was estimated at 171,095,200; 1920 was about 136,000,000. Population of 1920, 130,707,600, Soviet Russia.

The following is a table of the Russian governments, provinces, and territories, with their areas (exclusive of inner waters), populations, and capitals.

EUROPEAN RUSSIA (PROPER) GOVERNMENTS	Area, sq. miles	Population (1912)	Capital
Archangel or Arkhangelsk	326,063	462,500	Archangel
Astrakhan	91,042	1,279,400	Astrakhan
Bessarabia	17,143	2,538,900	Kishinev
Cholm	24,504	1,068,000	Cholm
Courland	10,435	758,800	Mitau
Don Cossacks, Province of the	63,532	3,691,300	Novotov
Ekaterinoslav	24,477	3,214,900	Ekaterinoslav
Esthonia	7,605	479,700	Reval
Grodno	14,896	1,997,600	Grodno
Kaluga	11,942	1,430,400	Kaluga
Kazan	24,587	2,792,400	Kazan
Kharkov	21,041	3,329,700	Kharkov
Kherson	27,337	3,547,500	Kherson
Kiev	19,676	4,635,700	Kiev
Kostroma	32,432	1,745,800	Kostroma
Kovno	15,518	1,819,000	Kovno
Kursk	17,937	3,133,500	Kursk
Livonia	17,574	1,479,700	Riga
Minsk	35,220	2,926,200	Minsk
Mohilev	18,514	2,307,200	Mohilev
Moscow	12,847	3,303,400	Moscow
Nizhni Novgorod	19,789	2,034,900	Nizhni Novgorod
Novgorod	45,770	1,646,400	Novgorod
Olonetz	49,355	454,500	Petrozavodsk
Orel	18,042	2,676,300	Orel
Orenburg	73,254	2,121,200	Orenburg
Penza	14,997	1,853,900	Penza
Perm	127,502	3,853,900	Perm
Podolia	16,224	3,882,700	Kamenetz-Podolsk
Poltava	19,265	3,763,100	Poltava
Pskov	16,678	1,390,000	Pskov
Riazan	16,190	2,607,600	Riazan
St. Petersburg	17,226	2,949,000	St. Petersburg
Samara	58,320	3,658,900	Samara
Saratov	32,624	3,156,100	Saratov
Simbirsk	19,110	1,997,500	Simbirsk
Smolensk	21,624	2,050,200	Smolensk
Tambov	25,710	3,473,000	Tambov
Taurida	23,312	1,965,900	Simferopol
Tchernigov	20,232	3,083,500	Tchernigov
Tula	11,954	1,829,200	Tula
Tver	24,975	2,250,200	Tver
Ufa	47,109	2,988,500	Ufa
Vilna	16,181	1,989,900	Vilna
Vitebsk	16,983	1,875,100	Vitebsk
Vladimir	18,821	1,941,800	Vladimir
Volhynia	27,699	3,995,700	Zhitomir
Vologda	155,265	1,678,600	Vologda
Voronezh	25,443	3,491,200	Voronezh
Viatka	59,329	3,869,100	Viatka
Yaroslav	13,723	1,239,300	Yaroslav
Total of European Russia (proper)	1,887,028	123,618,700	

POLAND GOVERNMENTS	Area, sq. miles	Population (1912)	Capital
Kalish	4,377	1,245,200	Kalish
Kielce	3,897	992,500	Kielce
Lomza	4,072	694,400	Lomza
Lublin	6,499	1,575,100	Lublin
Piotrkow	4,730	2,013,600	Piotrkow
Plock	3,641	755,400	Plock
Radom	4,769	1,134,800	Radom
Suwalki	4,756	693,000	Suwalki
Warsaw	6,749	2,639,400	Warsaw
Total Poland	43,490	11,743,400	

GRAND DUCHY OF FINLAND GOVERNMENTS	Area, sq. miles	Population (1912)	Capital
Abo-Björneborg	9,332	508,600	Abo
Kuopio	16,498	339,000	Kuopio
Nyland	4,584	388,100	Helsingfors
St. Michel	8,819	201,600	St. Michel
Tavastehus	8,334	345,400	Tavastehus
Uleåborg	63,954	326,900	Uleåborg
Vasa	16,104	515,500	Vasa or Nikolaistad
Viborg	16,624	515,000	Viborg
Total Finland	144,249	3,140,100	
Total of European Russia (proper), including Poland and Finland	2,074,767	138,502,200	

CAUCASUS GOVERNMENTS PROVINCES AND TERRITORIES	Area, sq. miles	Population (1912)	Capital
Baku	15,061	1,054,000	Baku
Batum (Prov.)	3,550	168,500	Batum
Black Sea	2,578	136,200	Novorossisk
Daghestan (Prov.)	11,471	702,500	Temir-Khan Shura
Erivan	10,725	986,600	Erivan
Kars (Prov.)	7,238	383,300	Kars
Kuban (Prov.)	36,645	2,830,200	Ekaterinodar
Kutais	14,083	1,025,000	Kutais
Stavropol	20,654	1,294,400	Stavropol
Sukhum (Ter.)	2,875	140,600	Sukhum-Kalé
Terek (Prov.)	27,902	1,231,600	Vladikavkaz
Tiflis	17,315	1,202,500	Tiflis
Yelizavetpol	16,991	1,035,800	Yelizavetpol
Zakatal (Ter.)	1,750	96,900	Zakatali
Total Caucasus	189,071	12,288,100	

SIBERIA GOVERNMENTS AND PROVINCES	Area, sq. miles	Population (1912)	Capital
Amur (Prov.)	172,286	230,200	Blagovestchensk
Irkutsk	280,429	714,900	Irkutsk
Kamtchatka (Pr.)	270,483	38,500	Petropavlovsk
Maritime (Prov.)	712,585	572,000	Vladivostok
Sakhalin (Prov.)	16,400	14,200	Alexandrovsk
Tobolsk	535,739	1,963,300	Tobolsk
Tomsk	327,173	3,855,200	Tomsk
Transbaikal (Pr.)	229,520	893,200	Chita
Yakutsk (Prov.)	1,530,253	325,600	Yakutsk
Yeniseisk	981,607	970,800	Krasnoyarsk
Total Siberia	4,575,883	9,577,900	

CENTRAL ASIAN PROVINCES	Area, sq. miles	Population (1912)	Capital
Akmolinsk	225,074	1,454,100	Omsk
Ferghana	35,446	2,093,200	Khokand
Samarkand	26,627	1,187,000	Samarkand
Semipalatinsk	178,320	855,800	Semipalatinsk
Semiretchensk	144,550	1,239,200	Vyernyi
Syr-Darya	194,147	1,897,300	Tashkent
Turgai	169,832	680,100	Turgai
Transcaspian	213,855	486,200	Askhabád
Uralsk	137,679	834,100	Uralsk
Total Central Asia	1,380,382	10,727,000	
Total Russia in Asia	6,145,336	32,593,000	
Grand total Russian Empire	8,220,102	171,095,200	

For 15 years, from 1897 (when Russia's first national census was taken) to 1912, the population of the Empire increased at the rate of about 2,857,600 a year—about 42,864,000 in all; this despite frequent famine, wars, cholera, and heavy emigration. The last averaged 187,700 a year between 1906 and 1910, a total of 938,700 for the whole period, most of it headed for the United States. The population according to the Bolshevist census of Aug. 20, 1920, was about 136,000,000. A Bolshevist estimate placed the population on July 1, 1921, at 130,707,600. This includes the Ukraine, Caucasus, Turkestan, and Siberia (with the possible exception of the Far Eastern Republic), but, of course, did not include territory which had passed to Finland, Poland, Esthonia, Latvia, Lithuania, and Rumania. See VOLUME XXIV and BOLSHEVISM.

Education. Russia is much behind most of the nations of western Europe in education. The efforts of Peter the Great and his successors were concerned entirely with the upper classes and higher education. The continuous exertions of the government are the source of the refined culture of the upper classes, of the numerous scientific institutions, the multiplication and improvement of universities and middle schools, and the better training of the clergy. But, in consequence of the existence of serfdom, no account was taken of the masses of the people until the reign of Alexander II. Since that time great progress has been made, but, owing to the sparsity of the population and the differing levels of civilization throughout the Empire, as well as the opposition of the absolutist régime to popular enlightenment, it will be long before a high average of education is attained. Not half of the children of school age actually attend school. The average literacy through the Empire is about 21 per cent, the lowest being in Central Asia (5.3 per cent) and the highest in the by-Vistula governments (30.5 per cent). Most of the schools of the Empire are under the Ministry of Public Instruction and the entire Empire is divided into 15 educational districts. Many normal, technical, and other special schools are supported by one or another department of the government or the Holy Synod or are conducted as private institutions. There were in 1912 more than 8,030,088 scholars attending elementary, secondary, and other schools in Russia (about 124,000 in all). Its 10 universities in 1911 had 39,853 students, with the universities of Moscow (9940 students) and St. Petersburg (8446 students) in the lead.

Religion. The orthodox Greek faith is the established religion of the Empire and according to official estimates its adherents are about 70 per cent of the entire population. The adherents of the various faiths number approximately (1915):

Orthodox Greek (including dissidents)	89,000,000
Catholics	11,420,000
Protestants	4,000,000
Other Christians	1,200,000
Mohammedans	14,000,000
Jews	6,000,000

To this must be added some millions of Buddhists and pagans. The Jews are placed under grievous restrictions and various sects of dissenters from the established faith and the followers of certain new creeds, some of them extremely heterodox, have been subjected to severe restraints and even to persecution. Roman Catholics are most numerous in Poland, Lutherans in the Baltic provinces, Mohammedans in the eastern and southern part of the Empire, and the Jews in the towns and cities of the western and southwestern provinces. The Empire is divided into 66 bishoprics, which are under 3 metropolitans, 14 archbishops, and 50 bishops. The monasteries numbered 942 in 1909 (including 418 nunneries), with about 8600 monks and 10,000 nuns. The clergy are in a sense the spiritual representatives of the state. See GREEK CHURCH.

Ethnology. The Russian Empire is populated mainly by a Slav group of the Caucasic stock, belonging to the alpine or brachycephalic type. The true Russians constitute nearly three-fourths of the population of Russia in Europe, the rest being Letto-Lithuanians, Poles, Jews, Finns, Turco-Tatars, Mongols, and Germans. The true Russians are divided into three groups. 1. Great Russians or Muscovites, about 65,000,000, occupy the entire centre of European Russia and form two-thirds to three-fourths of the population in the north and east. 2. The Little Russians or Malo-Russians, otherwise called Ukrainians or Ruthenians, about 20,000,000, are in the southwest. The Cossacks are Little Russians in speech. They are settled in a compact body in Little Russia, whence they have thrown off colonies to the southeast. 3. The White Russians number 6,000,000 in four governments in the west. There are upward of 6,000,000 Russians in Asiatic Russia. See Colored Plate with EUROPE, PEOPLES OF.

Other peoples living in the Russian Empire are as follows: *Slavic:* Poles, about 8,000,000, about three-fourths of them in Poland, the bulk of the remainder being in the western governments of Russia proper; about 200,000 Bulgarians, and a few Czechs and Serbs. *Teutonic:* Germans, about 2,000,000, mainly in the Baltic provinces, Poland, and in colonies in South Russia; Swedes, 300,000, mainly in Finland. *Finnic:* Finns and Karelians, about 3,500,000 in Finland and the neighboring parts of Russia proper; Esthonians, about 650,000 in the Baltic regions; Mordvins, Votyaks, Tcheremisses, and other kindred peoples scattered over a large area in northern and eastern Russia, about 1,500,000; Lapps in Lapland and Samoyeds in the extreme northern parts of Russia and Siberia. *Letto-Lithuanian:* Letts and Lithuanians, about 3,500,000, the former in the Baltic region, the latter in the western governments and Poland. *Iranian:* Armenians, Kurds, and Persians and other tribes, 1,300,000, principally in the Caucasus. *Daco-Roman:* Rumanians, 1,100,000, in southwest Russia. *Semitic:* Jews, about 5,000,000, in western and southwestern Russia and Poland. *Caucasus Aborigines:* Georgians, Mingrelians, Lesghians, etc., 2,400,000. *Turco-Tatar:* Tatars, Uzbegs, Bashkirs, Kirghiz, Turkomans, etc., in all about 13,600,000. *Mongol:* Kalmucks, in Russia and Central Asia; Buriats, Tunguses, etc., in Siberia. The Mongols number about 600,000. There are also 1,000,000 Europeans of various nationalities, a large number of Gypsies, various hyperborean tribes (Yakuts, Koriaks, Eskimo, Kamchadales, etc.) numbering about 34,000, and a number of Chinese, Japanese, and Koreans in eastern Siberia.

History. In ancient times the Russian plains were for the most part outside of the known world and were spoken of as inhabited by wild Scythian and Sarmatian tribes and, farther away, in the unknown, by those to whom the

ancients gave the name of Hyperboreans. Later the Slavs from the Baltic and the banks of the Elbe and the Danube spread over the plains to the eastward. Their organization was tribal and there was among them no capacity for unified systems to moderate their tribal conflicts. There were centres like Novgorod and Kiev that assumed, by the ninth century, a certain importance, but there was no national unity. About the middle of the ninth century a Scandinavian leader, Rurik (q.v.), came to Novgorod with a band of warlike followers in response to an invitation to establish order and unity. From this event the Russian historians date the beginning of the Russian Empire, the foundation of which they place in the year 862. Oleg (879–912), acting as Regent for Igor, son of Rurik, made Kiev the capital of the embryo empire, subduing the neighboring tribes, and even made a successful raid against Constantinople. Igor (912–945) was succeeded by his widow Olga (945–957), who was baptized in 955 by the Patriarch of Constantinople and abdicated soon after in favor of her son, Sviatoslaff (957–972), a warlike pagan, who was treacherously murdered. The principality was then divided among his three sons, and the quarrels usual in such cases followed, continuing till Vladimir the Great (980–1015), the youngest son, became sole ruler. The Varangians (the name applied to the Scandinavians by the Slavs) now became amalgamated definitely with the Slavic race. Vladimir's successful wars extended the boundaries of Russia to Lake Ilmen on the north, to the mouth of the Oka on the east, to the falls of the Dnieper on the south, and to the sources of the Vistula on the west. He became a convert to Greek Christianity and in 988 was baptized with his followers. Vladimir followed the evil example of his father in dividing his dominions. After his death dissensions broke out among his sons. For a time Sviatopulk (1015–19) ruled as Grand Prince of Kiev, but he was overthrown by his brother Yaroslav, who held the mastery over Kiev till his death in 1054. Under this Prince the first code of Russian laws, the *Ruskaya Pravda*, was compiled. Yaroslav's sons shared the principality among them. Each of these princes in turn divided his portion of territory among his sons, till the realm became an agglomeration of petty states which fought each other almost continuously for four centuries.

The principal subdivisions of Russia during this period were: Susdal, in the upper and central parts of the basin of the Volga, from which, in the beginning of the thirteenth century, grew the principalities of Tver, Rostov, and Vladimir; Tchernigov and Seversk, which occupied the basin of the Desna (an affluent of the Dnieper), extending nearly to the sources of the Oka; Riazan and Murom, along the Oka basin and about the sources of the Don; Polotsk, including the basins of the Western Dvina and the Beresina; Smolensk, occupying the upper parts of the basins of the Western Dvina and the Dnieper; Volhynia and Galicia (Halicz), the first in the basin of the Pripet (an affluent of the Dnieper), the second lying on the northeast slope of the Carpathian Mountains; Novgorod, by far the largest of all, occupying the immense tract bounded by the Gulf of Finland, Lake Peipus, the upper parts of the Volga, the White Sea, and the Northern Dvina; and the Grand Principality of Kiev, which, from its having been formerly the seat of the central power, exercised a sort of supremacy over the others. Novgorod (q.v.), from its position, became a flourishing commercial state, which rose to great power. The citizens chose their own princes, archbishops, and, in general, all their dignitaries. One of the chief factories of the Hanseatic League was established in Novgorod in the thirteenth century. The people of these various principalities enjoyed considerable liberty through the influence of the common council or vyetch, without which the Prince was almost powerless.

In 1163 the ruler of the Principality of Vladimir took possession of Kiev and proclaimed himself Grand Prince. In 1224 the Mongol tide of invasion, sweeping westward from Asia, reached the Polovtses, a nomadic tribe who ranged over the steppes between the Black Sea and the Don and whose urgent prayers for aid were promptly answered by the Russian princes; but in a great battle, fought (1224) on the banks of the Kalka (a tributary of the Sea of Azov), the Russians were totally routed by Genghis Khan (q.v.). The Mongols did not follow up their victory for some time, but in 1237–38 Batu Khan (q.v.), at the head of a vast horde, conquered eastern Russia, destroying Riazan, Moscow, Vladimir, and other towns. The heroic resistance of Prince George of Vladimir cost the lives of himself and his whole army on the banks of the Siti (1238). The Mongol conqueror's career was arrested by the forests and marshes south of Novgorod and he was forced to return to the Volga. In 1240 he swept over the southwest, destroying Tchernigov and Kiev; ravaged Poland and Hungary, defeating the Poles, Silesians, and Teutonic Knights on the field of the Wahlstatt (1241) and the Hungarians on the Sajó; but being checked in Moravia and receiving at the same time the news of the Khan's death, he retired to Sarai, on the Akhtuba (a tributary of the Volga), which became the capital of the great khanate of Kiptchak (q.v.). The Mongol invasion destroyed the elements of self-government, which had already attained a considerable degree of development in Russia, arrested the progress of industry, literature, and the other elements of civilization, and threw the country more than 200 years behind the other states of Europe. Oriental customs and methods became fixed among the people, separating Russia more and more with each generation from western Europe. In the early part of the fourteenth century extensive territories, including Volhynia and Kiev, were conquered by the Lithuanians. At this time eastern Russia consisted of the principalities of Susdal, Nizhni Novgorod, Tver, Riazan, and Moscow, and long and bloody contests took place between the two most powerful of these, Tver and Moscow, for the supremacy. Under Ivan Kalita (1328–40), the founder of the system of administrative centralization which prevailed down to the time of Peter the Great, Moscow became the paramount grand principality. Ivan's son and successor, Simeon the Proud (1340–53), followed in his father's footsteps. The Grand Prince Dmitri IV (1362–89) profited by the weakness of the Mongol khanate to make the first attempt to shake off the foreign yoke under which the Russians had groaned so long. His brilliant victory over the Khan Mamai at Kulikovo on the banks of the Don (1380), which gave him the surname of Donskoi, was the first step to liberation. Nevertheless the Mongols succeeded in taking Moscow, exacted a heavy tribute from the people, and riveted their bonds

more firmly than ever. Vassili (Basil) II (1389–1425) conquered Rostov and Murom. Vassili III, the Blind (1425–62), reigned during a period of wars waged by various princes for the grand ducal throne; but from this period the division of power in eastern Russia rapidly disappeared, internal troubles ceased, and the reunited realm acquired from union the power to cast off the Tatar yoke.

These results were achieved by Ivan III (1462–1505), surnamed the Great, who availed himself of every opportunity for suppressing the principalities which owed him allegiance as Grand Prince. He succeeded in adding Novgorod to the Muscovite dominions and delivered Russia from the Tatar yoke in 1480. He was also successful in his struggles with Lithuania and in carrying out important judicial reforms. His marriage to Sophia Paleologue in 1472 strengthened the prestige of Moscow and gave rise to the idea that Moscow was to become the Third Rome. Vassili III (1505–33) followed closely his father's policy, made war upon the Lithuanians, from whom he took Smolensk, and incorporated with his dominions the remainder of the small tributary principalities. His son, Ivan IV (1533–84), surnamed the Terrible, became monarch at the age of three years, and the country during his long minority was distracted by the contentions of the nobility or boyars (see BOYAR), who strove for power. On his attaining his majority, however, in 1547, in which year he assumed the title of Czar, he found two wise and prudent counselors, Silvester and Adashev, who, together with the Czarina, Anastasia Romanov, exercised over him a most beneficent influence. Ivan's arms were everywhere victorious and he annexed the khanates of Kazan (1552) and Astrakhan (1554). The marauding Tatars of the Crimea were held in check and the Knights of the Sword were driven from Livonia and Esthonia. Many internal improvements were made and the commerce between England and Russia by way of the White Sea was inaugurated. The latter part of Ivan's reign was marked by savage cruelty. Stephen Báthory, King of Poland, wrested Livonia from him, and the Crim-Tatars, in 1571, invaded Russia and burned Moscow. It was during the reign of this monarch that western Siberia was conquered for Russia by the Cossack Yermak. (See SIBERIA.) Feodor, Ivan's son, was the last reigning monarch of the house of Rurik. He died childless, and his only brother, Dmitri, was murdered, in 1591, by order of Godunov (q.v.), according to popular rumor. After the death of Feodor representatives of all classes were convoked at Moscow to elect a new sovereign, and their choice fell on Boris Godunov (1598–1605). The mysterious death of Dmitri favored the appearance of pretenders to his name and rank, the first of whom (see DEMETRIUS), on the sudden death of Boris Godunov, was crowned in 1605. A revolt, headed by Prince Vassili Shuiski (1606–10), soon broke out, the Czar was murdered, and Shuiski was elevated to the vacant throne as Vassili V. But a second false Dmitri now appeared, and Sigismund of Poland, whose son, Ladislas, had been elected Czar by the boyars, invaded Russia and took possession of Moscow (1610). At the same time hordes of Tatars and bands of Poles and robbers devastated the provinces. There followed a national uprising under Minin and Pozharsky, who retook the capital, drove the Poles out of Russia, and convoked an assembly of representatives, who unanimously chose for their Czar Michael Feodorovitch Romanov (1613–45). See ROMANOV.

The new monarch put an end to the revolt of the Don Cossacks and to the depredations of the robber gangs in the southwest. In 1618 and 1634 he purchased peace from the Poles at the cost of Smolensk and a portion of Seversk. Alexis (Alexei) (1645–76), Michael's son and successor, being a minor, the nobles seized the opportunity of increasing their power and exercising oppression and extortion over their subjects, till rebellion broke out in various districts. The changes and corrections in the books and liturgy of the Church introduced by the Patriarch Nikon brought about the rise of a dissident sect. (See RASKOLNIKS.) Little Russia was acquired by the voluntary submission of the Cossacks (see POLAND), who had revolted against the oppression of the Polish magnates. In the war with Poland which followed Russia acquired Smolensk, with part of White Russia and all of the Ukraine east of the Dnieper, together with Kiev. Alexis was succeeded by his son Feodor (1676–82), under whom the first war between Russians and Turks was brought to a successful issue. After Feodor's death the general council, in accordance with his wishes and their own, chose his half brother Peter as Czar, but his half sister Sophia, an able and ambitious princess, succeeded in obtaining the reins of power as Princess Regent and in having her own brother, the half-witted Ivan, proclaimed coruler with Peter. After an attempt to deprive Peter of the throne she was forced to resign all power and retire to a convent. Her accomplices were executed, and Peter (1689–1725) became sole ruler. His reign was one of tremendous energy and national development. He attempted to transform the semi-Oriental society of Russia, by main force of autocracy, into an Occidental society and to make Russia a European power. Peter's schemes for the territorial aggrandizement of the Empire, as continued by his successors, were carried out in turn at the expense of Sweden, Poland, and the Turks. He transferred the Russian capital from Moscow to St. Petersburg (Petrograd), which he built on territory wrested from Sweden. He brought into being a well-disciplined army with which he crushed the Swedish King at Poltava (q.v.) in 1709. By the Peace of Nystad (1721) Russia was confirmed in possession of Livonia, Esthonia, Karelia, and Ingermanland. Azov had been taken from the Turks in 1696 and transformed into a base for the naval power which Peter hoped to establish on the Black Sea, but as a result of the Czar's unfortunate campaign beyond the Pruth it was retroceded to the Sultan by the Treaty of Hush (1711).

Peter's only son, Alexei, had shown himself inimical to his father's political schemes and had met a premature death in 1718 (see ALEXEI PETROVITCH), and the crown passed by will to Peter's wife, Catharine I. Her short reign of two years was followed by that of the unfortunate Alexei's son, Peter II (1727–30), who was entirely under the influence of the powerful family of the Dolgoruki. Upon his death the Privy Council, setting aside the other descendants of Peter the Great, bestowed the crown on Anna, the daughter of his imbecile brother, Ivan. Anna Ivanovna (1730–40) freed herself from the domination of the Dolgoruki and the Golitzin, but was entirely under the influence of the German party.

From 1736 to 1739 a successful war was carried on against the Turks, but without any territorial profit to the Empire. Anna Ivanovna was succeeded by Ivan (1740–41), the infant son of her niece, Anna Karlovna (q.v.), under the regency of Biron (q.v.). Biron was speedily overthrown and Anna Karlovna assumed the regency, but only to succumb to a palace conspiracy, which placed on the throne Elizabeth Petrovna, the daughter of Peter the Great. Elizabeth (1741–62) joined Austria against Prussia in the Seven Years' War (q.v.) and showed herself the relentless foe of Frederick the Great. The Russian armies gained victories over the Prussians at Grossjägerndorf (1757) and Kunersdorf (1759), and for a moment Berlin itself beheld the presence of Russian troops (1760). The death of Elizabeth (1762) saved Frederick in his desperate straits, for her successor, Duke Peter of Holstein-Gottorp, a son of Peter the Great's second daughter, Anna Petrovna, was a fervent admirer of the Prussian monarch, with whom he entered into an alliance. In July, 1762, Peter III was dethroned as the result of a conspiracy headed by his wife, a princess of Anhalt-Zerbst; some days afterward he was murdered and his wife ascended the throne as Catharine II (1762–96).

Catharine furthered the spread of Western civilization in Russia, introduced important administrative changes in the government, enacted laws favorable to the development of commerce and industry, founded schools and charitable institutions, and granted religious liberty to the Raskolniks. Abroad Catharine carried out with striking success her ambitious schemes for the aggrandizement of Russia. She was the guiding spirit in the spoliation of Poland (q.v.), in the three partitions of which (1772, 1793, 1795) Russia gained 180,000 square miles of territory with 6,000,000 inhabitants. Two successful wars were carried on against the Turks, the first of which (1768–74) was terminated by the Peace of Kutchuk-Kainardji, in which Turkey renounced her suzerainty over the Crimea and other Tatar regions. The Crimea was incorporated with Russia in 1783. The second war (1787–92) was concluded by the Peace of Jassy, which advanced the Russian frontier to the Dniester. Paul I (1796–1801), son and successor of Catharine, was engaged continually in a struggle with a hostile aristocracy. He placed the press under a severe censorship and established a system of secret police. He joined the coalition against France and then withdrew from it, and was preparing to make war against England when he was assassinated by conspirators.

Alexander I (1801–25) was a lover of peace and largely imbued with the humanitarian ideas of the eighteenth century. He began his reign auspiciously by abolishing serfdom in the Baltic provinces and establishing a number of ministries for the more efficient administration of the Empire. He joined the third coalition against France, and his share in the defeat at Austerlitz (1805) did not deter him from allying himself with Prussia in the following year. The indecisive slaughter at Eylau (q.v.) and the crushing defeat of the Russians at Friedland (June 14, 1807) led to the famous meeting between Napoleon and Alexander at Tilsit, where the Russian Emperor, in return for entering into Napoleon's schemes, was allowed a free hand in Sweden and Turkey. From the former Finland and the Aland Islands were wrested in 1809. Turkey, after a six years' contest, was compelled in the Treaty of Bucharest (May 28, 1812) to cede the land between the Dniester and the Pruth. Alexander's abandonment of the continental system was followed by the invasion of Russia by the French (1812). Upon the disastrous termination of the campaign the Russian Emperor became the leading spirit in the alliance which carried the war into Germany and France and brought about the overthrow of Napoleon. (See NAPOLEON.) By the Congress of Vienna, in 1815, the bulk of the Duchy of Warsaw, which Napoleon had created in 1807 out of the dominions acquired by Prussia in the spoliations of Poland, was erected into the new Kingdom of Poland, which was placed under the sceptre of Russia. In the meanwhile the establishment of Russian dominion in the region of the Caucasus was proceeding rapidly. In 1801 Georgia was annexed and in 1813 Daghestan, Baku, and Shirvan were acquired from Persia. The last 10 years of Alexander's reign were a period of disillusionment for those who had expected the introduction of a liberal régime in Russia. The reign of Alexander's youngest brother, Nicholas I (1825–55), opened with a rebellion on the part of the liberal element in behalf of his elder brother, Constantine, who had renounced his title to the throne. The rebellion, known as the rising of the Decembrists or Dekabrists, was crushed and the ringleaders were summarily dealt with. Soon after the accession of Nicholas war with Persia broke out (1826), marked by a successful invasion of that country by Paskevitch (q.v.). The Treaty of Turkmantchai (Feb. 22, 1828) gave part of Armenia to Russia. Russia took part in the destruction of the Turkish-Egyptian fleet at Navarino (1827), which event virtually secured the liberation of Greece. In 1828 Russia made a fresh onslaught upon Turkey. The victories of Wittgenstein, Paskevitch, and Diebitsch led to the Treaty of Adrianople (q.v.) in 1829, in which Turkey transferred to Russia the suzerainty over the tribes of the Caucasus, accorded to the Czar a protectorate over Moldavia and Wallachia, and agreed to recognize the independence of Greece. In 1830 the Poles revolted, drove out the Grand Duke Constantine, and organized a provisional government. They carried on a brilliant and aggressive campaign against the Russian forces until May, 1831, when the strength of Russia began gradually to overwhelm them. Warsaw capitulated on September 8. On Feb. 26, 1832, a new statute was promulgated by Nicholas I treating Poland as a conquered state. (See POLAND.) In 1834 the conquest of the Caucasus, which occupied Russia for 30 years, was begun. In 1848–49 the Austrian Imperial government, unable to suppress the Hungarian revolt, asked Russia for assistance. This was readily granted. (See HUNGARY.) In 1853 Nicholas again made war upon the Ottoman Empire. France and Great Britain, later joined by Sardinia, interfered, and the Crimea became the theatre of a bloody conflict. Sebastopol fell in September, 1855, six months after the death of Nicholas. The Treaty of Paris closed the struggle in 1856. Russia was compelled to part with a strip of Bessarabia, the Black Sea was neutralized, and the Russian protectorate over the Danubian principalities was abolished. See CRIMEAN WAR; EASTERN QUESTION.

The accession of the son of Nicholas, Alexander

II (1855–81), introduced a new era of internal reforms. The abolition of serfdom in 1861 created more than 20,000,000 freemen, whom a system of state loans enabled to secure small farms on an installment plan of payment. Corporal punishment and the farming of the taxes were abolished. There were important reforms in the judiciary, separating judicial from administrative functions. In the face of revolutionary agitation (see NIHILISM) the earlier reform tendencies of this reign gave way to a reactionary policy. Another Polish insurrection broke out in 1863 and was suppressed with extreme severity. By a succession of ukases the Kingdom of Poland was in the course of a few years incorporated in the Russian Empire. (See POLAND.) Vast accessions were made to the dominions of Russia. In 1858 the Amur Land was formally made over to the Czar by China. The subjugation of the Caucasus was completed between 1859 and 1864. The establishment of Russian supremacy in Central Asia, which was begun under Peter the Great, was completed in this reign. In 1868 Samarkand was occupied and the Khan of Bokhara became a vassal of Russia. In 1873 Khiva became a subject state. In 1876 Khokand (Ferghana) was annexed. Skobelev's capture of the Tekke fortress of Geok-Tepe in 1881 practically completed the conquest of the transcaspian country. Russia had always been restive under the provision of the Treaty of Paris relating to the navigation of the Black Sea, and in 1870, upon the fall of the Emperor Napoleon III, who had been the chief sponsor for the treaty, the Russian government intimated that it felt no longer bound by the provisions of the treaty. At the London conference of 1871 this claim was admitted by the Powers. This was the beginning of a resumption of the aggressive attitude towards Turkey. The Porte's maltreatment of its Christian subjects and the Turkish atrocities in Bulgaria (q.v.) in 1876 led to a conference of the Powers at Constantinople. This conference made certain proposals looking towards a reform in the Turkish administration. Upon the rejection of these proposals by Turkey Russia undertook to enforce them and in April, 1877, declared war. The war was conducted with great energy by Russia and in January, 1878, the Russian forces were in the vicinity of Constantinople. The war was closed by the Treaty of San Stefano (March 3, 1878), which was materially modified by the intervention of the Powers through the Congress of Berlin. (See BERLIN, CONGRESS OF; RUSSO-TURKISH WAR.) In 1867 Russia gave up her vast possessions in Arctic America, transferring Alaska by sale to the United States.

There had for some time been increasing discontent among the people in consequence of the government's repressive measures. There were numerous outbreaks, but in 1880 Alexander seemed to have returned in a measure to his earlier liberalism. The secret police was abolished and Loris-Melikov (q.v.) was appointed as Chief Minister with extraordinary powers. This seemed for a time to quiet the disorders and it was confidently hoped that agitation would cease, but on March 13, 1881, the Emperor, while on his way to the Winter Palace in St. Petersburg, was killed by the explosion of a bomb thrown by one of a group of revolutionary conspirators.

Alexander III (1881–94), influenced no doubt by the reaction due to his father's assassination, took for his advisers the leaders of the extreme Russian and autocratic party. His policy was one of peace in Europe, though the advance of Russia in Central Asia continued to arouse concern in England. The acquisition of Merv in 1884 brought Russia close to Herat, the key to Afghanistan, the buffer state of British India. In 1885 war between Russia and England seemed imminent, but the difficulties were settled by the appointment of a joint commission, which adjusted the Afghan boundary. In 1891 the construction of the Trans-Siberian Railway was begun. Since 1887 close relations with France have been established and maintained, as an offset to the Triple Alliance (q.v.), Austria, Germany, and Italy. About 1880 an antisemitic agitation was started which resulted in the legal and extralegal persecution of the Jews. The Jews were confined by law to the Pale of Settlement, outside of which they could establish themselves only by special privilege. Even within the Pale the Jews were prohibited from acquiring real estate in the country and were forced to crowd into the towns, where the only occupations open to them were handicraft and petty trade. Great masses of them sank into poverty. With legal restrictions came physical persecutions, at different times taking the form of riot and massacre. See POGROM.

Alexander III died Nov. 1, 1894, and was succeeded by his son, Nicholas II (q.v.). In his reign the development of Asiatic Russia by railways was pushed steadily forward. After the intervention of Russia, with the other Powers, at the close of the China-Japan War of 1894–95, Russia was able to obtain from China a lease (March 27, 1898) for 25 years of the Kwangtung peninsula, which was made a province. Here are the strong naval station of Port Arthur and the new port of Dalny, built by Russia. By the treaty with China providing for the construction of the Manchurian Railway, which is really a part of the great Siberian system, Russia maintained a military occupancy of Manchuria. After the Boxer troubles in China in 1900 this occupation, the original pretext of which was the protection of the railway, was so strengthened as to cause apprehension on the part of other nations that Russia was about to carry out in Manchuria her traditional Asiatic policy of absorption of such provinces belonging to weaker powers as might be available. War with Japan as a direct result of its aggressive advance broke out in 1904. See RUSSO-JAPANESE WAR.

Far more important than the progress and defeat of Russian expansion in Asia was the internal history of the Empire under Nicholas II. Reaction, which had been triumphant under Alexander III, continued unabated in spite of more or less serious attempts at paternal legislation in behalf of the peasantry. On the other hand, the efforts of the zemstvos to improve the condition of the agricultural population by the founding of schools and hospitals, the establishment of a system of compulsory fire insurance, the building of roads, and other local measures, were constantly hampered by the agents of the central government. With the beginning of the new century a revolutionary movement appeared. It took the form of student disorders in the great university towns. The assassination by a student of the Minister of Education, Bogoliepov, in February, 1901, opened the period of revolutionary terrorism. The Minister of the In-

terior, Sipiaguine, was killed in April, 1902. In June, 1904, Governor-General Bobrikov, of Finland, who had taken a leading part in the suppression of the liberties of that duchy, was killed and his death was followed within a few weeks by that of the Minister of the Interior, Plehve (q.v.), who, with the procurator of the Holy Synod, Pobedonostsev (q.v.), represented the extreme embodiment of reaction.

The revival of revolutionary agitation may be ascribed to a number of causes, chief among which were the comparatively rapid industrial development of the country under Nicholas II and secondly the fatuously repressive policy of the government in respect to the various nationalities within the Empire. Under the inspiration of Sergius Witte (q.v.), for many years Minister of Finance, the building of railroads was pursued on an extensive scale and large amounts of foreign capital were brought into the country for the establishment of factories and mills under extremely favorable conditions granted by the government. Large manufacturing towns sprang up in the western provinces and Poland, while Moscow and St. Petersburg, with other cities of the interior, drew to themselves a constantly increasing industrial population. There was strife between entrepreneurs and employees, and the new class of factory workers became a much more favorable soil for the planting of the revolutionary seed than the peasants under Alexander II had ever been. And inasmuch as the factory workers were largely recruited from among the peasants who were accustomed to migrate from and to their fields according to the season of the year, the revolutionary movement was soon carried from the cities into the villages by the peasants themselves. In March, 1903, Witte succeeded even in inducing the Czar to publish a manifesto promising the establishment of freedom of worship, together with a revision of the agrarian laws and the methods of local administration. In August of the same year, however, Witte was compelled to resign the portfolio of Finance and was shelved in the post of President of the Ministerial Council. The counsels of reaction as represented by Plehve had triumphed.

The second cause which contributed to the rapid growth of the revolutionary movement, as mentioned, was the oppression of the nationalities by the government. The policy of Russification was carried on relentlessly in the Baltic provinces (q.v.), in Finland, and in Poland, where Nicholas II had gained temporary popularity by certain concessions at the beginning of his reign. The policy of suppression as practiced in Finland and Poland was supplemented by the policy of inciting one nationality against the other. In the Baltic provinces the Lettish peasantry were stirred up against their German landlords; in the Caucasus Tatars and Armenians were played off against each other in turn. Against the Jews, whom Plehve considered as ripest for revolution, the government fomented the hatred of the Christian population. Far from attaining its object, however, the government, in setting the various nationalities against each other, worked its own harm. The Jews, driven to arm themselves for self-defense against the mob, the Armenians, who took up arms against the Tatars, and the Letts, who were upheld against the Germans, soon learned to turn their weapons against the government, as the events of 1905 and the succeeding year showed.

By the middle of 1904 popular discontent began to find open expression in the form of riots, strikes, and political pronunciamentos. The assassination of Plehve on July 28 removed the strongest supporter of the absolutist system. He was succeeded in the Ministry of the Interior by Prince Sviatopolk-Mirski, whose well-known liberal tendencies seemed to promise the opening of a new régime. A significant event was the assembling at St. Petersburg, in November, of delegates from the zemstvos, who, after deliberating in private, submitted to the Czar a report declaring that the government had fallen completely out of touch with the people and their wants; that bureaucratic methods of administration had alienated the people from the throne; that the establishment of equality of civil and political rights with absolute freedom of conscience, religion, speech, and the press was imperative; and finally, that a Legislative Assembly of two Houses should be constituted, the Lower House consisting of members of the zemstvos. In December a congress of zemstvo (q.v.) presidents at St. Petersburg, in addition to reiterating the declaration of the preceding assembly, called for the bestowal on the peasants of rights equal to those of other classes of the nation and the reorganization of the zemstvos and municipalities on a popular basis and with independent powers of local government. An Imperial manifesto issued in December held out the promise that when the time came for introducing particular reforms these would be forthcoming, even though the process involved the "introduction of essential innovations in legislation," and admitted that there was urgent need of removing religious disabilities and unnecessary restrictions on the press and of extending the powers of local administration. But at the same time the necessity of maintaining the "autocratic empire" and the "immutability of its fundamental laws" was asserted.

In St. Petersburg strikes broke out among the employees of the factories and of the government ironworks. The leader in the movement was Father Gapon (q.v.), a priest, who, with the consent of the authorities, had been organizing labor unions in order to win away the workingmen from the influence of the revolutionary agitators. On Jan. 21, 1905, Father Gapon addressed a letter to the Czar informing him that on the following day the strikers would march in a body on the Winter Palace in order to submit their grievances to him in person. On the following day crowds of men, women, and children, in part led by Father Gapon, marched upon the Winter Palace. At different points in the city and in the palace square they were met by troops, who opened fire on the unarmed multitude. The massacre lasted for some hours, and the victims of Red Sunday, as that January 22 came to be called, numbered several hundred killed, according to the most conservative estimate, and thousands wounded.

The immediate result of Red Sunday was the outburst of a succession of great strikes in all the great industrial centres—St. Petersburg, Moscow, Warsaw, and Lodz in Poland, in the south, and in the Caucasus—which, with longer or shorter intermission, continued throughout the ensuing period of struggle. Rioting and collisions with the police and the troops necessarily followed. In March the Kingdom of Poland was placed in a state of siege. The war with Japan pursued its course of unbroken disaster. In the

beginning of March came the great defeat at Mukden, followed in the last days of May by the final crushing defeat in the battle of the Sea of Japan. The government began to give way and concessions were granted in piecemeal, surrounded with grudging restrictions, and always too late. On April 29 a ukase was issued, granting liberty of worship to the Old Believers and abolishing the religious disabilities of Roman Catholic and other Christian communities. (See RASKOLNIKS.) Secession from the Orthodox church was permitted. A ukase of May 16, dealing with Poland, ordered the Governor-General to take steps for the introduction of the zemstvo system into that Kingdom and provided for a broader use of the Polish language in the schools and in the administration. Poles in Lithuania, Volhynia, and Podolia were freed from the prohibition against acquiring landed property in those provinces. Nevertheless anarchy and assassinations of government and police officials were common all over the Empire. More peaceful modes of political agitation went hand in hand with violence. As the ministerial deliberations made it clear that the government was contemplating the creation of a legislative body with closely restricted powers and elected upon a narrow and complicated franchise, the more moderate elements of the liberal movement went actively into opposition. On July 19 a congress of representatives from the zemstvos and the dumas, or municipalities, met at Moscow and protested against the proposed system of election by classes and the exclusion of the workingmen and the professional classes from the franchise. On August 15 a congress of the Peasants' Union met at Moscow. The congress demanded universal suffrage for all persons over 20 years of age without distinction of sex, a constituent assembly, and the establishment of a system of peasant proprietorship by the nationalization and distribution of the lands of the crown and the monasteries.

A revolt took place on one of the Black Sea fleets. Riots occurred in the naval ports of Reval, Libau, and Kronstadt. This new spirit of disaffection in the armed forces of the Empire as much as anything doubtless hastened the appearance of the electoral manifesto which was promulgated on August 19. It provided for the creation of a *Gosudarstvenaia Duma*, or State Council, composed of elected representatives from the whole of Russia to act as a "special consultative body in the preliminary examination and discussion of measures and in the examination of the budget." Such measures were first to be submitted by the Council of the Empire to "the supreme autocratic authority in accordance with the fundamental laws." In other words, the Duma had no power of initiative, though it might interpellate the ministers. The members were to be elected for a period of five years. The total number was 412 for 50 provinces (ultimately increased to 524), of whom 25 were elected by certain cities and towns. The franchise was conferred on peasants, landowners, and, in the towns, on owners of real estate to the value of $750 or proprietors of industrial establishments having a minimum value of $7500. The actual electoral system was made indirect to a high degree. The deputies from each province were to be chosen by an electoral college consisting of representatives of the peasants, the urban classes, and the landowners. The manifesto was received with profound disappointment. It placed the Duma under the control of the Council of the Empire and the bureaucracy; it excluded the working and the professional classes from the franchise; it did not guarantee freedom of speech, the press, or assembly. Strikes broke out at St. Petersburg and Moscow early in October, and on the 26th of that month a general strike of the railway employees throughout the Empire was declared. The railway men were joined by other unions under the supreme direction of a central body known as the Union of Unions. In St. Petersburg even the justices of the peace refused to officiate. The severance of communications brought trade to an absolute standstill, the large cities were threatened with famine, and the power of the government was for a time paralyzed. In the face of so universal an upheaval the Czar yielded and on Oct. 30, 1905, issued a manifesto which was hailed in the beginning as Russia's constitution. The author of the manifesto was Sergius Witte, who had but recently returned from negotiating peace with Japan at Portsmouth and who was now appointed Prime Minister. The manifesto announced that the sovereign had directed his government to prepare measures granting to the people "the immutable foundations of civil liberty based on real inviolability of the person and freedom of conscience, speech, union, and association"; "to call to participation in the Duma those persons completely deprived of electoral rights, leaving the ultimate development of the principle of the electoral right in general to the newly established legislative order"; "to establish it as an immutable rule that no law can come into force without the approval of the Duma and that it shall be possible for the elected of the people to exercise a real participation in the supervision of the legality of acts of authorities."

Real liberties thus seemed to have been finally acquired at a blow. The manifesto was received with delirious popular joy in the great towns and revolutionary processions with the red flag were tolerated even in St. Petersburg. Then the iron hand of the government was suddenly brought down with more than the old autocratic violence. In the capitals and the provincial cities the crowds of demonstrators were attacked by the police and the troops with fearful carnage. At Odessa, Kiev, Kishinev, Nikolaev, and other places in southern Russia the mob, with the connivance of the local authorities and, as was afterward shown, under the inspiration of General Trepov (q.v.), commandant of the Imperial palace and chief of police, perpetrated horrible atrocities on the Jews, who were regarded as the mainstays of the revolutionary propaganda. The three months that followed the appearance of the October manifesto were a welter of merciless repression, mutiny, agrarian riots, armed insurrection, and assassination. The administrative machinery was disorganized and the provincial authorities were left to pursue largely their own policies. In Poland, where a state of comparative order prevailed, bitter indignation was aroused by a manifesto of November 13, which declared that owing to their fomenting sedition and aiming at establishing their independence of Russia, the inhabitants of that Kingdom would "receive none of the benefits resulting from the manifestoes of August 19 and October 30." On November 16 the government announced the total abolition after Jan. 14, 1907, of the redemption rules accruing to the state from the peasants for

advances made under the emancipation decree of 1861. At the end of November a second general strike was proclaimed and disorder prevailed in almost all the provinces. Over the greater portion of them the Russian authority was totally paralyzed and was supplanted by provisional revolutionary governments ruling in the name of the Baltic republic. The revolutionary movement attained its climax at Moscow, where an armed uprising took place on Dec. 21, 1905. It was a critical moment for the autocracy, but its troops held loyal and after a week of desperate barricade fighting the insurrection was suppressed with an estimated loss of 5000 lives and great destruction of property. Ruthless reprisals on the part of the soldiers followed. On December 26, when the government seemed to have the situation well in hand, a ukase ordered the preparations for the Duma elections to be proceeded with and laid down broader foundations for the franchise in accordance with the promises extended in the October manifesto. The suffrage was conferred on owners of real property subject to taxation for a year before the election, owners of industrial concerns paying taxes, persons paying inhabited house duty, persons possessing dwellings in their own name, and persons in receipt of salaries from the state, the zemstvos, the municipalities, or the railway administration. Workmen in manufacturing establishments having more than 50 and less than 1000 employees could choose one delegate to the local electoral body, with an additional delegate for every 1000 employees. The peasant franchise remained unchanged. The system was a fair approach to universal manhood suffrage.

Amidst continued disturbances preparations for the Duma elections went on during the first months of 1906. Political parties assumed some definite form. See POLITICAL PARTIES, *Russia;* RUSSIAN PEOPLE, LEAGUE OF.

The elections to the first Duma began in March, 1906. At the same time an Imperial manifesto (March 6) announced the reorganization of the existing Council of the Empire as a second chamber to act in conjunction with the Duma and on an equal basis. Half of its members were nominated by the Czar; the other half were elected for a term of nine years by the zemstvos, the Holy Synod, the universities, the chambers of commerce, the representatives of the nobility, and the representatives of Polish landowners. The Duma assembled in the Winter Palace on May 10. The Czar announced to the deputies his unswerving determination to uphold the institutions which he had granted, and called upon them to work "for the rejuvenation of Russia's moral outlook and the reincarnation of her best powers." The Duma came into immediate conflict with the crown. Its first demand was for a general amnesty, since it was considered intolerable that the Duma should take up its work while thousands of those whose efforts had made the Duma possible were languishing in prison. The address in reply to the Czar's speech was voted on May 18, after a three days' debate. It called for the establishment of universal suffrage, for a ministry enjoying the support of the Duma, for the abolition of the Council of the Empire, and for the suspension of the state of siege throughout the country. It proposed measures guaranteeing the equality of all classes before the law, the abolition of all class, religious, and racial disabilities, and reforms in labor legislation, public finance, education, and local government. On the agrarian question the Duma declared for a system of compulsory land expropriation with compensation and the distribution of the nationalized land among the peasants. The ministerial reply to the address precipitated a deadlock which continued to the end. Count Witte had resigned the premiership in May after his proposals for effecting reactionary changes in the electoral law had been rejected. His successor, Goremykin, declared to the Duma that amnesty was impossible in the case of persons guilty of murder and other acts of violence; that the proposed solution of the agrarian question was impossible; that other measures proposed by the Duma involved an alteration in the fundamental laws of the Empire and were thus beyond the competence of the Duma. He submitted in turn a programme of mild reform. The Duma replied by a vote of no confidence and called upon the ministry to resign. Revolutionary disturbances recommenced. In Siberia and southern Russia there were military mutinies. In Biolystok (June 14) a massacre of the Jews took place, and a committee of the Duma discovered evidence of the government's complicity. To put an end to the constant military executions, especially in the Baltic provinces, where the participants in the revolution of the preceding winter were being mercilessly dealt with, the Duma passed a motion for the abolition of capital punishment, but without in any way influencing the course of the government. The final clash came over the government's agrarian proposals. These were of a liberal nature, but did not include compulsory expropriation. The Duma replied by preparing an appeal to the nation and thereby sealed its fate. On July 22 it was dissolved by an Imperial ukase, which fixed March 5, 1907, as the date for the meeting of a new Duma. Prime Minister Goremykin was replaced by M. Stolypin. Over 200 members of the dissolved Duma met at Viborg in Finland and issued an appeal to the nation to defend its rights by refusing to pay taxes or to enter the ranks of the army while the Duma was not in session. Their appeal did not meet with the expected response.

There ensued another era of terrorism and repression. A formidable insurrection at the fortress of Sveaborg in the Baltic (July 30) seemed to promise the long-expected collapse of the army's loyalty, but it was suppressed after bloody fighting. There was a premature rising at Kronstadt on August 1. The Terrorists commenced their campaign by exploding a bomb in the home of Premier Stolypin (August 25) and killing over a score of persons. The Premier, who was unhurt, soon after issued a declaration of his policy. It called for the rigorous enforcement of order coupled with the introduction of the greatest possible measure of liberty—the so-called policy of "strong-handed reform." Drumhead courts-martial were established to try cases of violence against the public order in districts placed under the various degrees of martial law. These soon came to include all but three or four provinces in the Empire. Throughout the winter of 1906–07 the courts-martial continued to act, while in reply terrorism continued to pick off its enemies in the government. The Stolypin ministry formulated an agrarian programme, which was designed to win over the peasantry by promising the abolition of the communal system of landownership and the sale at reasonable terms of large tracts of land owned by the state or

offered by landowners to the peasant banks. The elections to the second Duma took place early in 1907 and, in spite of acts of repression and tampering with the electoral law which disfranchised large bodies of voters, they resulted in an overwhelming triumph for the radical parties. The Left, consisting of the Social Democrats, Social Revolutionists, People's Socialists, and the Group of Toil (peasants), numbered 210 deputies out of 524. The Constitutional Democrats were about 110 in number, the Moderates (Octobrists) about 30, the Right (Monarchists) about 70, the Polish Nationalists about 35.

The second Duma met on March 5. The Constitutional Democrats held the balance of power and made strong efforts to steer the Duma into channels of constructive legislation. The Monarchist groups tried to discredit the idea of a national representative body by disorderly conduct and obstructionist tactics. The Socialist and revolutionary groups were convinced that the Duma could do no constructive work under the then existing conditions and did their best to turn it into a tribune from which to incite the masses of the people to radical action. The Social Democratic members of the Duma were accused of organizing a military plot and the Duma was requested to hand them over to the authorities. The committee of the Duma which was appointed to investigate this question brought in a report rejecting the demands of the government, but before action could be taken by the Duma the latter was dissolved.

Having dissolved the Duma, the government proclaimed a new electoral law, known as the Law of June 3. The number of deputies was reduced to 442, mainly at the expense of the radical non-Russian nationalities inhabiting the frontier districts of the Empire. A complicated system of indirect elections based on class distinctions was introduced which gave the great landholders more than half of the electoral votes (2647 out of 5252) and reduced to a minimum the electoral votes of the working population. Even with this law the government continued to coerce the voters. The result was that the third Duma, which met on Nov. 1/14, 1907, was composed of 154 Octobrists, 51 Rights (Extreme Monarchists), 80 Nationalists and Moderate Rights; the Constitutional Democrats numbered only 53, the Group of Toil only 14, and the Social Democrats 19. The small number of Socialist deputies was due not only to the law, but in large measure to the fact that the revolutionary and Socialist parties had boycotted the elections.

The Octobrists thus became the dominant party of the third Duma. From the very beginning they made it clear that they were determined to work hand in hand with the government. In its session of 1908–09, the third Duma approved the Agrarian Law of Nov. 9, 1906, which had been passed in an unconstitutional way. The Duma further considered and took action on the law establishing sickness insurance for workingmen, on the law granting a larger measure of religious freedom, etc. A particularly flagrant violation of constitutional methods was resorted to in the passage of the law which introduced local self-government into the western provinces without the consent of the Duma. In order to reduce the latter to impotence the government encouraged and patronized such institutions as the Council on Local Economy and the Conventions and Councils of the Delegates of the Nobility. The former was consulted on all important occasions and was requested to prepare bills which, according to the law, were within the domain of the Duma. The council acquired such extralegal influence that it was nicknamed the Ante-Duma. Through these bodies the government was seeking support in the conservative and reactionary forces of the great landowners and the bureaucracy.

Ignoring the Duma and suppressing the activities of the revolutionary groups, Premier Stolypin began anew a vigorous policy of oppression with regard to the non-Russian nationalities. Finland was deprived of its constitutional liberties and made subject again in all essential matters to the Imperial authorities. The Poles were restricted in their national activities, while the Jews were subjected to a series of measures which made their life in Russia intolerable. The culmination of this policy was reached in the famous Beilis Case, which recalled to life some of the worst features of the Middle Ages.

The five years of the third Duma (1907–12) were the worst period of the counter-revolution which began with the dissolution of the first Duma. The turning point of the counter-revolution was reached in 1912 during the elections to the fourth Duma. But the tide had begun to turn back several years before as a result of revelations which showed the demoralizing effect of the government's secret police. The revelations of the government agent Azev in 1909 aroused all Europe, and the Duma was forced to interpellate the government on that account. On Sept. 5, 1911, Stolypin himself supposedly became a victim of his own secret service policy and was assassinated. Goremykin, who was appointed in Stolypin's place as Premier, announced that he would continue the policy of his predecessor. But the patience of the people seemed exhausted. On the occasion of the death of the great Russian thinker, Leo Tolstoy, a wave of protest swept the country, finding expression in numerous mass meetings and demonstrations. The universities once more came to the front as centres of democratic revolt. In the spring of 1912 the movement was reënforced by the workers who were aroused by the shooting of miners during a strike in Lena.

Under these conditions the elections to the fourth Duma would have resulted in a realignment of parties had not the government used all its forces of repression and had it not mobilized for this purpose the entire clergy of the country. In view of the action of the government the composition of the fourth Duma differed but little from that of the third. But the growing discontent among the general electorate had its effect on the members of the Duma and became evident soon after the opening of the first session on Nov. 15/28, 1912.

The new spirit began to manifest itself in various ways. In November, 1912, municipal elections were held in St. Petersburg (Petrograd) and Moscow, which resulted in a sweeping victory for the Liberals. Strikes broke out in many places and conditions resembled in many respects those of 1905. The country was again thrown into a state of political excitement and the government called a conference of governors to consider the question of reforming the police.

During this period the Duma at first acted cautiously. On Feb. 21, 1913, the government

published its manifesto granting a number of minor favors only. The Duma now became more demonstrative. On March 13/26, 1913, it passed a resolution expressing the desire for a change in the electoral laws (of June 3, 1907) and for freedom from governmental interference in elections. On May 21 the Duma went even as far as expressing its disapproval of the policy of the Minister of the Interior, whom it accused of spreading the spirit of discontent among the people. At the same time, however, the Octobrists, who controlled the fourth Duma, were careful not to take too radical a step. They supported the government in its policy of Russification in Finland, Poland, and elsewhere. In general the year 1913 in Russia may be characterized as one of wavering between conservative and radical action.

In the summer of 1914 things were evidently approaching a crisis. In July, 1914, all the large cities of Russia were in the throes of strikes and street demonstrations. Encounters between the police and the workers were taking place daily, and it seemed to many observers of Russian life that the country was entering upon a new phase of its revolutionary history. Things, however, quickly changed with the outbreak of the Great War of 1914. The whole people rallied at once to the support of the government. The Duma convened on July 26 and pledged its full support for the defense of the fatherland. The government was also bent on concessions and permitted the holding of conventions by the Union of Zemstvos and the Union of Cities for the purpose of organizing the service for the care of the wounded and for the relief of the population. The government also prohibited the sale of vodka (q.v.), which, according to all expert opinion, was undermining the health and efficiency of the Russian population. The manifesto to the Poles and a number of other acts were proof that the government was anxious to gain the confidence of the people. See POLAND; WAR IN EUROPE.

The successful campaign of the Russian army in Galicia changed matters considerably. The government once more stiffened and neglected to live up to its promises. It delayed to carry out its programme of reform in Poland and, moreover, it began a policy of Russification in conquered Galicia which was in direct opposition to its promises of reform. The setback which the Russian armies suffered in the summer of 1915 forced the government once more to look to the people for support. During a session of the Duma the government was subjected to the most scathing criticism on all sides. The heavy losses of the army, the inefficiency of the munitions service, and the disorganization in all branches of the military department aroused the Russian nation to a high pitch of indignation. The so-called Progressive Bloc, which was formed in the summer of 1915, was a combination of Octobrists, Constitutionalists, and Moderates on a programme of democratic reforms which are considered essential for the victory of the country. On July 20, 1915, these progressives introduced a resolution demanding a government responsible to the Duma. A campaign was begun for a national Ministry of Defense representing all parties. But the government prorogued the Duma on September 14.

See CAVALRY; SLAVONIC MUSIC; SOCIALISM; TCHEREMISSES; TCHUVASHES; ZYRIANS; Plate of INFANTRY.

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RUSSIA LEATHER. See LEATHER.

RUSSIAN ARCHITECTURE. The indigenous architecture of Russia is a development of the Byzantine (q.v.). It is related to that of Armenia, of the Caucasian region, and of Moldavia. The great peculiarity of the Russian style, that which makes it at once remarkable and recognized among other styles of building, is in the great extension given to the idea of the cupola or lantern, which in one form or another crowns nearly all the churches in the land. For all these buildings are of the central type, in contradistinction to the basilica type; i.e., they are arranged around a central space instead of having long parallel aisles. The typical Russian church, generally square, or nearly so in its main outlines, is roofed by a cupola over the central space and at least four minor cupolas covering four chapels at the corners, while the aisles and porches between have minor roofs on a much lower level. In the case of some of the large wooden churches the rounded cupola is replaced by a blunt spire or pyramid of timber covered with plank, while this pyramid may terminate in a very small cupola, apparently studied from Persian design. The wooden churches are generally in the far north, and these, like Norwegian buildings of the same class, are almost wholly without window openings. To keep out the cold and to facilitate the warming, the worshipers use the light of lamps almost exclusively. The masonry churches of the centre and south are very like those of Athens and other places in Greece in compact plan and generally in their small size, but none are so minute as the Greek examples.

The official architecture of the Empire since the time of Peter the Great has been largely a rather unsuccessful imitation of the supposed grand style of the eighteenth century. The massive cathedral of St. Isaac in St. Petersburg is a marvelous structure, but there is little in the design to please the student of mere classic art. The porticoes are splendid because they could be closely copied from Roman examples, and their gigantic monolithic columns with gilt-bronze capitals suffice to give them splendor, but the design of the mass and the application of the cupola to it are of little value. A finer church is that of Our Lady of Kazan in St. Petersburg, with a great portico where curved wings project on both sides, somewhat in imitation of the Piazza di San Pietro in Rome. Consult: Rikliter, *Monuments of Ancient Russian Architecture*, translated (1850); Souslow, *Monuments de l'ancienne architecture russe* (Leipzig, 1895–1901); Martinoff, *Anciens monuments des environs de Moscou* (Moscow, 1889); Montferrand, *Eglise cathédrale de Saint-Isaac* (St. Petersburg, 1845).

RUSSIAN CHURCH. See GREEK CHURCH.

RUSSIAN LANGUAGE, THE. The most important of the Slavic languages (q.v.), with respect to the number of its speakers and its literature. It is probably spoken by as many as 110,000,000 people throughout the Russian Empire and by about 4,000,000 Ruthenians in Galicia, Bukowina, and Hungary. It is also heard in Alaska and the United States. As early as the tenth and eleventh centuries Russian

had a pronounced individuality and a number of well-defined dialects. The chief influence on Russian was exercised by the Church Slavonic, the contributions from the Tatar (quite few), Polish, German, Dutch, and French being limited to additions to the vocabulary. About the sixteenth century the Russian language reached its present state as far as the main features of it, in sound and form, are concerned. After Peter had introduced the present "civil" alphabet, Lomonosov (q.v.) gave the Russian its modern aspect by means of his many grammatical and philological works. The spelling is rather historical than phonetic, e.g., *poemŭ* (we sing) is pronounced *payóm* in the Moscow dialect, but a pronunciation more phonetic is quite common. At present there are three distinct dialects of the Russian language:

1. *Great Russian*, found in its purest form about Moscow. This is the basis of literary Russian. It is used by nearly 70,000,000 people. Broadly speaking it is heard in the north, centre, and east of Russia, having two subdivisions: (*a*) North Great Russian and (*b*) South Great Russian.

2. *Ukrainian*, or *Little Russian*, spoken by over 30,000,000 people in the south and southwest of Russia and by the Ruthenians (q.v.) in Austria-Hungary. It possesses quite a literature of its own, the works of Shevtchenko being its finest specimens, although in Russia the dialect is under official ban. See UKRAINIANS.

3. *White Russian*, which shows the transition to Polish, spoken by about 8,000,000 people, in the western part of Russia, chiefly in Lithuania.

The phonetic characteristics of the Russian language and of its dialects are mentioned under the heading SLAVIC LANGUAGES. Other peculiarities are: (1) six or, if the vocative be included, seven cases; (2) three genders in nouns, adjectives, and past tenses of verbs; (3) two sets of terminations for adjectives; (4) two varieties of participles, (*a*) adjectival and (*b*) adverbial (= Fr. gérondif); (5) only three tenses, but (chiefly through composition with prepositions) a great variety of aspects, whereby a verb can be made to express, besides tense distinctions, the finest subtleties and shades of the Latin frequentatives, inchoatives, etc.; (6) a great variety of diminutives and augmentatives and an extraordinary capacity for compounds and derivatives; (7) finally, the disuse of the copula in the present tense and the absence of the article. The arrangement of words is almost entirely free, as the grammatical inflections obviate misunderstanding. This elasticity gives to the Russian tongue an incisiveness and perspicuity that most modern languages lack. On the other hand, the freedom of accent (there are Russian words with the accent on the seventh syllable from the end) and the variety of vowels allow of a great variety of cadences and poetic effects. Thanks to these qualities, works of such varied character as those of Homer, Æschylus, Shakespeare, Petrarch, and the French Symbolists and Parnassians can be and have been translated into Russian with unsurpassable fidelity to the form and spirit of the originals.

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RUSSIAN LITERATURE. The literature of Russia naturally reflects in its course the vicissitudes of that country's history—her long

and frequent foreign invasions, her centuries of semi-Asiatic seclusion and stagnation, her sporadic waves of Western influence, and her political and social transformations. The student will do well to familiarize himself with the outlines of Russia's political and social history if he would clearly understand her literary development. He will thus see how the restraints of a rigid censorship and the limitations in the sphere of political activity have imparted to Russian literature its marked satirical, didactic, and utilitarian tendencies, and will perceive the social factors which enter into the pessimistic and realistic attitude, as well as the moral earnestness and intensity characteristic of the best Russian writers.

Since the literary activity of Russia is not merely a result of the Russian nation's past, but also embodies a reaction against that past, it is difficult to subdivide it into homogeneous periods; opposite currents alternate throughout the whole of its history, when they do not coexist side by side. Nevertheless it is possible to distinguish three periods as follows: (1) the early period (to 1650); (2) the period of transition (1650 to the beginning of the nineteenth century); and (3) the modern period (from the age of Pushkin to the twentieth century).

Early Period (c.1000–1650). The earliest epoch of Russian literature is intimately connected with the mother of Russian cities, Kiev, which in the eleventh century was one of the richest and most beautiful in Europe. Second to it was the merchant Republic of Novgorod, important for its Hanseatic and Scandinavian connections. The memory of these cities' glory has been preserved in the epic songs (*byliny*) of the Russian peasants, which have come down to us by way of oral tradition. These *byliny* show, besides elements of foreign (Iranian, Finnish, and Scandinavian) origin, reminiscences of early Russian history, beliefs, and ideals. Unfortunately the Russian language was not employed in the written literature of the early period. When Vladimir, Prince of Kiev, embraced Greek Christianity, at the close of the tenth century, the Old Church Slavic language was used in liturgy and a little later also for official and literary purposes. This circumstance was not without its advantages, inasmuch as it introduced a ready literature; on the whole, however, it was an evil, since it hindered the establishing of a truly national literature and stood in the way of spiritual contact with the Latin West.

The ecclesiastical productions of this period consist of homilies, moral and religious precepts, legends, controversial and apologetic writings, lives of saints and churchmen, monastic and church regulations, church service books, and the like. To these may be added a number of monastic chronicles, descriptions of pilgrimages, and apocryphal and dissident legends, prayers, and songs. Most of these productions followed Byzantine and South Slavic originals. The works of a secular character comprise, besides legal documents and statutes, a goodly number of prose romances, historical works, florilegia, and didactic treatises of all sorts.

The most important as well as most interesting secular works were produced at the beginning of this period; they are the *Chronicle of Kiev*, better known as the *Chronicle of Nestor* (q.v.), a work which received its final redaction at the beginning of the twelfth century, and the *Story of the Raid of Igor* (q.v.). The *Chronicle* exemplifies the same epical qualities—naturalness, directness, and simplicity—which are found in the *byliny*. It found numerous more or less successful continuators and imitators. The *Story of Igor* is a twelfth-century prose epic, the publication of which (in 1800) was an event in Russian literature comparable to the appearance of the *Songs of Ossian* in the English.

In 1240 Kiev was pillaged and destroyed by the Tatars; its Metropolitan moved to Vladimir in 1299 and to Moscow some 30 years after. The inclusion of Kiev into the Kingdom of Lithuania and that country's union with Poland (the Personal Union of 1328 and again in 1501) prevented Kiev's lapsing into the state of barbarism evinced by Moscow. While many of the Kiev nobility went over to Protestantism and Catholicism and became Polonized, the merchants and artisans of Kiev, who remained faithful to the Greek church, maintained schools patterned after Western models. In 1580 Prince Constantine of Ostrog founded at that place a classical academy, which was followed by similar institutions at Vilna, Minsk, Brest, and Kiev. These schools taught the Latin classics and the art of scholastic disputation and trained a number of Greek Catholic theologians, historians, lexicographers, and even poets, or rather makers of verse. A more popular literature, consisting chiefly of romances of a mediæval character, in Polish and Church Slavic, appealed to the laity. The literary activity of Lithuania and of Kiev especially was frowned upon by the Muscovite clergy, whom it later helped to emerge from its intellectual degradation.

The sad cultural plight which prevailed in Moscow from the fourteenth to the middle of the seventeenth century was due not so much to the Tatar sword as to the pernicious influence of the Oriental spirit. The autocratic government of the Czars, which replaced the aristocracy of birth by an officialdom and demanded unconditioned obedience of all the classes of society, the ascetic spirit of that society with its reverence for the old and its fear and hatred of the new, its contempt for knowledge, its indolence and want of toleration —all contributed to make of the State of Moscow an Oriental despotism. For women to converse with any men but their immediate relatives, for men to shave, smoke, and wear trousers, were considered sins of the utmost gravity. On the other hand, true piety and morality were disregarded, formalism and conventionality being considered the essence of religion and morality. The greater part of the clergy were ignorant of the most essential dogmas of their own church, and this ignorance was only surpassed by Moscow's arrogance and self-sufficiency, which led it to proclaim itself as the third and last Rome and the culmination of divine economy in the history of mankind. Under such circumstances what literature there was in Moscow was chiefly ecclesiastic and lacked originality.

In the first half of the sixteenth century none of the Russian churchmen could read the Greek Testament, and when suspicion arose that the Slavonic texts might contain errors due to the negligence and ignorance of copyists, Greek scholars had to be employed to make translations from the originals. This task devolved

chiefly on Maximus the Greek (1480–1556), a learned, pious, and conservative ecclesiastic from the monastery of Athos. His name is worth remembering, not only as the bearer of classical learning into Russia, but also as the first of the long line of martyrs for which the history of Russian literature is so notorious. Accused of taking liberties with the sacred texts, he was flung into prison to linger for over a quarter of a century. One of his followers, Prince Kurbsky (1528–87) (q.v.), deserves special mention for his famous polemical letters to Czar Ivan, the only other educated layman of the time. Apart from the uniqueness of this correspondence, it is of literary interest as illustrating two wholly different styles of early Russian prose—Kurbsky's elegant, studied, and moderate and Ivan's ironical, sarcastic, and unrestrained. Kurbsky's *Chronicle of the Muscovite Tsar*, a painstaking but not impartial work, represents the first attempt at historical writing modeled on classical lines.

The chief representative of the Muscovite spirit is the *Domostroy* (1547–60), a compilation due in part to Pope Sylvester, adviser of Ivan IV. This guide on household management (its title means just that) comprises directions on the multifarious affairs of life, moral conduct, and the domestic relations, including precepts on the art of wife beating. Mention should be made here of another huge compilation, wholly ecclesiastical in character, completed in 1551. It bears the title of *A Hundred Chapters* (*Stoglav*) and is a compendium of church usage and tradition, a sort of golden treasury of spiritual lore, that must have seemed of tremendous importance to an age exercised over petty theological disputation.

Period of Transition (mid-seventeenth century to Pushkin). With the beginning of the seventeenth century a new spirit makes itself felt in Russian literature. The special impulse came from Kiev. When South Russia became severed from Poland a general exodus of Kievite scholars to Moscow set in, and on the wings of this migration Polish-Latin learning and literature, theological and secular, were carried into the heart of Russia.

The new spirit of the times was well represented by Kotochikhin (1630–67), who in his *Russia in the Reign of Alexei Mikhailovitch* (written in Sweden and discovered in manuscript only in 1837) assailed the ignorance and corruption of his age and pleaded for the light of learning; by the Servian reformer and Panslavist, Krizhanitch (1617–c.86) (q.v.), who in his *Polity* criticized contemporary conditions in Muscovite Russia and prescribed the necessary remedies; and especially by Simeon Polotsky (?–1680), of Kiev, a pioneer of culture and the first Russian versifier, who not only made frequent and significant digressions on secular learning in his religious writings, but wrote religious plays imitated from those of the Polish Jesuits and promoted the development of Western culture (best in scholastic form) in many ways. With Polotsky, therefore, the Russian seventeenth-century renaissance may be said to have fully begun—how well may be judged from the establishment of the first Russian theatre in 1674 and the earliest Russian newspaper (in manuscript form) soon after. If we remember that as late as 1647 the puritanical Moscow state, still under the sway of the Byzantine church, forbade all songs, games, and amusements, we may understand the tremendous literary significance of these last events.

Another and even more important phase of this transition period was the gradual introduction of the Russian vernacular in literature. The lack of a flexible, living literary language proved such a handicap by the time Peter the Great came to the throne that this many-sided reformer set about reforming the Russian language too. Beginning with the simplification of the alphabet, he and a host of others whom he encouraged or commanded modernized the language by eliminating its Church Slavonic incrustations and introducing French and German terms and constructions. The needs of the numerous translators whom Peter likewise set to work spurred on these linguistic labors, which engaged even such clerics as Bishop Feofan Propokovitch (1681–1736), the erudite and sagacious author of *Ecclesiastical Regulations* (1721), the only noteworthy literary work of the age of Peter the Great.

By far the greatest reformer and transformer of eighteenth-century Russian, however, was the versatile Lomonosov (1711–65) (q.v.). His works on grammar, rhetoric, and versification have helped to rid Russian of its barbarisms and to make it a fit medium for literary expression, thus paving the way for modern Russian literature. He himself wrote numerous odes, epigrams, dramas, etc., though not in the genuine Russian which he used in his scientific and other writings. In this connection should be mentioned Lomonosov's contemporary, Trediakovsky (1703–69), who, though hardly a poet, studied the laws of Russian versification and discovered its true tonic metre.

The third and most important phase of this eighteenth-century renaissance in Russian literature—the natural culmination of the two others—was the introduction of the so-called pseudo-classicism, the imitation of the seventeenth and eighteenth century literature of western Europe. This literature bears witness to the spirit of rationalism which prevailed among the upper strata of Russian society. The first wave of foreign literary influence that reached Russia in this century came from France, and Kantemir (1708–44) was its foremost representative. His satirical verses, vastly superior to any that preceded them in Russia, were frankly modeled on the French of Boileau. Next came Sumarokov (1718–77), the real creator of Russian belles-lettres, who wrote in many veins but was most successful in tragedy after the manner of Racine, Corneille, and Voltaire; Radishtchev (1749–1802), whose *Journey from St. Petersburg to Moscow* (1790), modeled on Sterne's *Sentimental Journey*, so displeased Catharine II by its picture of serfdom and heretical views that its author added another name to Russian martyrology; Fonvizin (1744–92), the first notable Russian satirist, whose comedies *The Brigadier* and *The Minor* showed up the gross ignorance that lay hidden under the veneer of Western culture in eighteenth-century Russia; Bogdanovitch (1744–1802), whose mythological lyric *Dushenka* (1773), suggested by Lafontaine's version of Apuleius' story of Psyche, enjoyed extraordinary popularity and helped to spread a taste for literature in Russia; Novikov (1744–1818) (q.v.), a publisher of popular literary magazines and disseminator of instruction among the people, whose activity in this direction was checked by Empress Catharine II,

who feared the spread of rationalistic ideas among the people. Most important of all was Karamzin (1766–1826), who continued the work of Lomonosov in the linguistic field by consistently employing the new Russian and freeing it from unnecessary neologisms. Karamzin's *History of the Russian Empire* (1818–29) and *Letters of a Russian Traveler* (1790–92) are both epoch-making works, while his Rousseauesque novels *Nathalia* and *Poor Liza* were greatly instrumental in creating a reading public in Russia, which he himself endeavored to satisfy by his two collections of masterpieces, *The Pantheon of Foreign Literature* and *The Pantheon of Russian Literature*. To this period, too, belongs the once celebrated poet Derzhavin (1743–1816) (q.v.), almost modern at times, with whom the period of transition practically ended.

Modern Period (1820 to the present time). It is customary to speak of the first part of this period as the romantic, just as the last of the preceding period is designated the pseudoclassical. They were short-lived in Russian literature, neither being truly national nor satisfying the Russian mind's passion for the real and concrete. Moreover, Russian romanticism did not and could not honestly claim to represent the revival of the spirit and literature of a bygone age, as was done by European romanticism.

Credit for introducing romanticism into Russian literature is generally given to Zhukovsky (1783–1852) (q.v.), who practically discovered the poetry of England and Germany for literary Russia and thus delivered it from the one-sided influence of French pseudoclassicism. This gifted poet, together with his great contemporary, Batyushkov (1787–1855), who worked in similar fields, though not in the same spirit, brought Russian verse to its highest technical perfection and almost exhausted the possibilities of imitative poetry. Whoever would excel them must needs bring to the task, along with supreme poetic gifts, the great gifts of originality and genuine national inspiration. This was done by Zhukovsky's own pupil, the unsurpassed Pushkin, with whom modern Russian literature really begins. We shall consider this period, the greatest of all, under the heads of (1) Poetry, (2) The Novel, (3) The Drama, (4) Literary Criticism, and (5) Recent Literature.

Poetry.—Pushkin (1799–1837) (q.v.), the father of modern Russian literature, which he made an independent branch of European literature, has given supreme expression to Russia's national spirit in literature. His epic *Ruslan and Lyudmila* (1820) represents the first successful attempt to draw subject matter from Russian antiquity and popular legends, while his drama *Boris Godunov* (1825) and his novel in verse *Evgeny Onêgin* (1825–32) rank among the best literature of the world. Second only to Pushkin was Lermontov (1814–41), who, though a Pushkin disciple and Byron enthusiast, had sufficient originality to rank as an independent poet. His verse is more spontaneous than his great master's and his lyric vein just as rich, though more melancholy. His prose novel *A Hero of our Time* (1839) was a masterpiece fully equal to Pushkin's novel just mentioned. Other great Russian poets were Koltsov (1809–42), the greatest Russian folk poet, sometimes styled the Russian Burns, who made poverty and peasanthood the burden of his art songs, by him invented and perfected; Nekrasov (1821–78), who extended the sphere of Koltsov to the downtrodden and oppressed of all classes and who makes up for the lack of sustained beauty and lyrical depth by raciness of language, vividness of description, and a strong satirical vein; Nikitin (1824–61), a poet less original than Nekrasov, but of greater intellectual calibre, whose verse is graceful and tender, though lacking in intensity of emotional appeal and pervaded by a touch of melancholy; Nadson (1862–87), a lyric singer, preëminently the poet of youth and its spiritual struggles, who lacked the sustained eloquence, the intensity of passion, and the national sentiment characteristic of Russia's greatest poets; and the famous fabulist Krylov (1768–1847), whose rare poetic gifts merit his mention in this connection, although his work belongs equally to the preceding century.

The Novel.—The novel is the greatest glory of Russian literature. If the rise of modern Russian poetry was sudden, the ascendancy of the Russian novel in the second half of the nineteenth century was nothing short of phenomenal. There was no real Russian novel before 1840, yet long before that century closed the best Russian fiction had already been written. Equally surprising perhaps is the fact that realism—and this characteristic of Russian literature is nowhere so impressive as in the novel—should have appeared full-fledged in Russian fiction at a time when it was still a novelty in the older European literatures. The first great Russian novelist and realist was Gogol (1809–52) (q.v.). His *Taras Bulba* (1835) and more especially the unfinished *Dead Souls* (1842) marked an epoch in the history of Russian literature and introduced to the world the long series of brilliant Russian novels that have made its literature famous.

The history of the Russian novel before Gogol is neither long nor interesting. It became a home product only in the thirties. Before his time the novel was known in Russia mostly in translation. The early original novels were either sentimental tales like Karamzin's *Poor Liza* (1792), already cited; moralizing or historical romances like Bulgarin's, Gretch's, and Zagoskin's, whose *Yuri Miloslavsky* (written in a sentimentally patriotic vein) was especially popular; or society novels like Bestuzhev-Marlinsky's, which were not without merit. Mention should be made here also of Lazhetchnikov (1792–1868), author of the most popular historical novels of his day, and Narézhny (1780–1825), probably Gogol's predecessor in the field of realism. But novels in the full modern sense of the term were a thing unknown before Gogol's day. The nearest approach to one was Lermontov's *A Hero of our Time*, the first Russian psychological novel, published, as we have seen, in 1839, three years before the epoch-making *Dead Souls*. Gogol's successors in fiction were as numerous as his predecessors were few and unimportant. We can mention but the greatest. The place of honor must always be given to Turgenev (1818–83) (q.v.), Russia's foremost novelist and greatest master of prose, who is an unsurpassed landscape painter and a close observer of the changing currents of Russian life; Dostoyevsky (1821–81) (q.v.), Russia's greatest psychological novelist, whose wonderful insight into the human soul fully atones for his trying prolixity and lack

of form; and Tolstoy (1828–1910), whose *War and Peace* (1873–76) and *Anna Karenina* (1877) rank among the world's literary masterpieces and whose work excels even Turgenev's in its faithfulness to life, while falling below it, owing to a pronounced moralizing tendency. Next we should mention at least Gontcharov (1812–91), a photographic artist, whose *Oblomov* (1858) is a masterly portrayal of a certain aspect of Russian life; Pisemsky (1820–81), with his gloomy but lifelike *A Thousand Souls* (1858); the satirical Shtchedrin-Saltykov (1826–89), whose *Provincial Sketches* (1857) was a bolder attack on Russian officialdom than even Gogol, writing 20 years earlier, dared to make in his *Dead Souls;* and Lieskov (1831–95), best known for his antinihilistic novels *No Way Out* (1864) and *To the Knife* (1870), who had wonderful inventive fertility, a fine literary style, and a great talent for conveying local color. Finally we must name a few folk novelists, who form a very important division in Russian literature. One of the earliest was Grigorovitch (1822–99), who ranks next to Tolstoy and Turgenev as a portrayer of peasant life. Then came Gleb Uspensky (1840–1902), Levitov (1842–77), Rieshêtnikov (1841–71), Zlatovratsky (1845–1911), and many others, down to Maxim Gorky.

The Drama.—The Russian drama has not attained the importance of the Russian novel. Although dramatic representations of religious plays were given in the seventeenth century, no regular plays are recorded before the middle of the eighteenth century. Sumarokov was, as we have seen, Russia's first regular dramatist, and he was followed by the talented Fonvizin and Empress Catharine II. It was, however, in the nineteenth century that the best Russian drama was produced. *The Woes of Wit* (1825) by Griboedov (1795–1829), a masterpiece of comedy still unsurpassed in Russian; the famous *Revizor* (1836) by Gogol and Pushkin's *Boris Godunov* fall within the first half century and show that the national drama had already found itself. Its development was brought to seeming perfection by Ostrovsky (1823–86), by far the greatest Russian dramatist, in such masterpieces of realistic drama as *Poverty Is No Vice* (1854) and *The Thunderstorm* (produced in 1859), the latter one of the best plays in the modern Russian repertoire. Of the rest space permits no more than a mention of Alexei Tolstoy (1817–75) (q.v.); Pisemsky, whose *Bitter Fate,* a good drama dealing with peasant life, seems to have suggested the great Tolstoy's *The Power of Darkness;* Potekhin (1829–1902), another novelist who wrote also for the stage; Turgenev, the author of five charming comedies; and Chekhov (1860–1904) (q.v.), Turgenev's worthiest successor, famous both for his inimitable short stories and his delightful comedies (*Uncle Vania, The Cherry Garden,* etc.).

Literary Criticism.—Ethics and æsthetics are never dissociated in Russian criticism, and both become handmaids of political reform and utilitarianism. Literary criticism, and art criticism generally, plays, therefore, a greater part in the intellectual life of Russia than is the case elsewhere. The great Russian critics were practically the intellectual leaders in their day and generation. For this reason, perhaps, Russian criticism has always been wholly subjective and has produced no figures comparable to Sainte-Beuve or Matthew Arnold.

The first to introduce literary criticism into Russian literature was Karamzin, and his work paved the way, the literary reviews of Pushkin's poems appearing in the *European Herald.* Then came Viazemsky, whose literary activity lasted from 1808 to 1878; Nadezhdin (1804–56); Polevoy (1796–1846), the real founder of serious journalism in Russia; and many others. But the real founder of Russian literary-æsthetic criticism was Belinsky (1810–48), a contemporary of Gogol, Turgenev, and Dostoyevsky. He was the first Russian to establish correct conceptions of art and literature and to bring down the history of Russian literature to certain well-defined periods. His influence on Russian literature was, and still is, very great.

Belinsky's illustrious successors were Chernyshevsky (1828–89), a realist and materialist, who did much to rid Russian thought of metaphysical speculation and to popularize science and whose "art for life's sake" doctrine gave Russian æsthetics its utilitarian basis; Dobrolubov (1836–61), a brilliant disciple of Belinsky and Chernyshevsky, who has left four volumes of serious and original critical essays; Pisarev (1841–68), the best essayist of them all, who carried his positivism and materialism to the point negating art and æsthetics (for which he was immortalized in Turgenev's *Fathers and Sons*); and Mikhailovsky (1842–1904), perhaps the greatest Russian critic, who gave literary criticism a philosophico-sociological turn by expounding the Spencerian doctrine of social progress. Among others that might be mentioned stand out the names of Vladimir Soloviev (1853–1900), poet and moral philosopher, whose literary criticisms approach the Western type; the poet and novelist Merezhkovsky, mentioned below; and the great Tolstoy, whose *What Is Art?* and similar essays in æsthetic criticism merit his inclusion in this section. See HERZEN; PANSLAVISM.

Recent Literature.—Just as during the first half of the nineteenth century the dominant form of Russian literature was the poem and in the second the novel, so during the first quarter of the present century the prevailing literary form has been the short story. Chekhov's high achievements in this field have, it would seem, made the short story popular in Russia, for some of his contemporaries and many of his successors have adopted this form almost exclusively. Among these we may mention Korolenko, Gorky, Andreev, Artsybashev (qq.v.), Kuprin, Potapenko, and Chirikov. Of the many others whose fame is not confined to the short story, but who achieved great success in it, special mention should be made of Sergeev-Tsensky, whose novel *Beauty* (1913) proved him a worthy disciple of Turgenev; Ropshin, whose novel *That Which Was Not* (1914) showed him as an imitator of Tolstoy; Chapygin, whose *The White Hermitage* (1913) is a realistic novel unsurpassed in recent Russian literature; Serafimovitch, a successful follower of Chekhov, whose *City of the Steppe* (1913) offers a striking contrast to the sensational fiction of the day; Zaitsev, the poet, whose *The Remote Region* (1913), though not strictly a novel, yet clearly accentuates the author's realistic tendency; Bialy, whose long novel *St. Petersburg* (1913–14) treats a revolutionary theme most charmingly; and Shmelev, whose social novel *The Man from the Restaurant* (1913) is a brilliant piece of realistic writing. All these writ-

ers, to whom should be added the names of Korolenko and the best contemporary poets, Kaminsky, Zaitsev, Balmont, Brusov, Feodor Sologub, and Alexander Bloch, hold up the best traditions of Russian literature. This cannot be said as a whole of the work of Gorky, which is concerned with the underworld; nor of Andreev's, which deals with the morbid innerworld in a most gruesome fashion; and certainly not of Artsybashev, whose sensational novel *Sanin* (1907) represents perhaps the lowest depths of contemporary Russian fiction. All three have written also plays, of which Andreev's are by far the most successful. A much quieter writer of fiction is Kuprin, whose short stories rank with Korolenko's and Potapenko's for naturalness, but whose latest novel, *The Pit*, is pornographic. Finally we must not fail to mention the very scholarly and versatile Dmitry Merezhkovsky, famous alike for his penetrative literary criticism (great studies of such men as Pushkin, Gogol, Tolstoy, and Dostoyevsky) and his imaginative work (especially his prose trilogy, *The Death of the Gods, The Resurrection of the Gods,* and *The Antichrist*).

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RUSSIAN MUSIC. See SLAVONIC MUSIC.

RUSSIAN OIL. See LAXATIVE.

RUSSIAN PEOPLE, LEAGUE OF (also known in Russia as the UNION OF TRUE RUSSIANS). This was formed towards the end of 1905 for the purpose of counteracting the revolutionary forces of the time. The organization was largely supported by the government, which found it an aid against the revolution. The members of the organization pledged themselves to develop the national spirit of the Russian people, to maintain the Russian Empire one and indivisible, and to defend the unlimited autocracy of the Czar and the power of the Orthodox church. The league declared that autocracy was the only form of government in harmony with the spirit of the Russian people, in accordance with divine law, and justified by history. All constitutional ideas, according to the league, were introduced into Russia by the non-Slavic nationalities and particularly by the Jews. The league, therefore, recommended a policy of restriction towards all the non-Russian inhabitants of the country and specially towards the Jews, whom the league blamed for all internal and external troubles of Russia. With reference to the other nationalities (Poles, Lithuanians, Letts, Finns, etc.) the league recommended Russification based on restriction of religious liberty and national rights. The Duma it regarded as created by the Czar of his free will and for his convenience to serve in an advisory capacity. Only "true Russians" were eligible for the executive committee which was to be elected for life by the founders of the organization.

This league did not merely carry on a propaganda, but took an active part in political life. During 1906–07 it was accused of organizing anti-Jewish pogroms and antirevolutionary massacres. It elected one member to the first Duma and a few to the second Duma. In the third Duma, owing to the law restricting the suffrage, they were strong enough to constitute a separate group, the party of the Right. The revelations of the activities of the secret police in which the league was involved repelled the better element, which separated from the league and formed the group of Right Octobrists. The remaining members quarreled over the spoils and split into two factions, one of which assumed the name of League of the Archangel Michael. Since 1910 the league has been losing in influence as a result of the new awakening of the liberal elements of the country. See RUSSIA.

RUSSIAN POLAND. See POLAND, RUSSIAN.

RUSSIAN TURKESTAN. See TURKESTAN.

RUSSIAN WOLFHOUND. See GREYHOUND.

RUSS'NIAKS. See RUTHENIANS; UKRAINIANS.

RUSSO-JAPANESE TREATY OF 1905. See RUSSO-JAPANESE WAR.

RUS'SO-JAPANESE' WAR (1904–05). A conflict between Russia and Japan growing out of Russia's attempt to make herself the most powerful nation in the Far East and her share in the curtailment of the conquests Japan had made at the expense of China in 1895. In that year Japan secured a foothold on the mainland of Asia by the acquisition of the Liaotung peninsula. Russia in concert with France and

Germany compelled Japan to retrocede this rich province to China. In 1898 Russia leased this same peninsula and made Port Arthur the much desired ice-free port and naval base on the Pacific. In 1900, in spite of her treaty stipulations, Russia further extended her sphere of influence by obtaining control of Manchuria as a result of the Boxer uprising. (See CHINA; FAR EASTERN QUESTION.) The immediate cause of the war was Russia's attempt to extend her methods of Russification and exploitation to Korea, which Japan considered her special sphere of influence. After several attempts to settle the difficulties by treaties in which Japan demanded especially the open-door policy in Korea and a delimitation of the influence of the two countries in Manchuria, war was declared on Feb. 10, 1904, although hostilities actually began almost a week previous.

Naval Operations. Active preparations for war had been going on for months in the two countries. The Japanese fleet had been put in first-class condition and was far superior to the Russian fleet in Eastern waters. The first engagement occurred on Feb. 8–9, 1904, when Admiral Togo (q.v.) surprised the Russian fleet just outside the harbor of Port Arthur and damaged it to such an extent that, while it was being repaired, it was possible for Japan to transport troops to the mainland without interference. The activities during the next three months consisted mainly of raids by the Vladivostok fleet, in which several transports and large quantities of contraband were captured or destroyed. The second week in August was a disastrous one for the Russians. The Port Arthur fleet was practically put out of action for the rest of the war in a long-range running fight on August 10. One vessel was interned at Kiaochow and another at Shanghai. Those that were able to get back to Port Arthur were destroyed just before the surrender of that city, without putting to sea again. Admiral Vithöft was killed in the engagement. The Vladivostok fleet was also seriously damaged on August 14 by Admirals Kamimura and Uriu. The *Rurik* was sunk and the other ships escaped, but only after serious injury.

Russia hastily collected another fleet in the Baltic and dispatched it to the Far East. It was poorly manned and disciplined, as is attested by the fact that it fired on British fishing boats on the Doggerbank as well as on some of its own vessels. Admiral Rozhdestvensky (q.v.) was in command. After taking aboard provisions and coal in Madagascar and French Indo-China, despite Japan's protest, it proceeded northward through the Sea of Japan. The main fleet consisted of 35 vessels, of which the most important were 8 battleships, 9 cruisers, and 7 destroyers. The enemy was sighted near Tsushima. It appeared unexpectedly from the east and found the Russian fleet arrayed for an attack from the west. Although the fight lasted two days it was decided in the first hour. The Russians lost 26 ships, about 4000 men, and 7000 prisoners. Six ships were interned in Manila and Shanghai. The Japanese lost 3 destroyers and about 670 killed and wounded.

Military Operations. The first important battle in the land activities was called the battle of the Yalu. General Kuropatkin, the commander in chief of the Russian forces, determined to hold a defensive position on the Liaotung peninsula until sufficient reënforcements arrived to assure some degree of success to an offensive movement. Instead of concentrating in Mukden or Port Arthur, he determined to make his base at Liao-Yang and to fortify a position along the Yalu River. Consequently he spread his force of between 15,000 and 20,000 men over a distance of 15 miles from the mouth of the river through his main position at Kiulien-cheng. He was outnumbered almost four to one by the Japanese under General Kuroki. The latter forced the passage of the river and completely routed the Russians, who lost 2300 men. The Japanese loss was about 1100.

The second Japanese army under General Oku was landed at Pi-tzŭ Wo (q.v.), north of Nanshan on the Liaotung peninsula early in May, for the investment of Port Arthur. Oku, with about 40,000 men and 216 guns and with the aid of the guns of the fleet, captured Nanshan on May 25, with the loss of 4300 men. The Russians lost 835. Dalny was occupied May 30, and the third Japanese army under General Nogi (q.v.) disembarked at this point to relieve Oku of the investment of Port Arthur. Oku turned north to meet an army under General Stackelberg, which Kuropatkin had sent to the relief of Port Arthur. Stackelberg was decisively defeated at Wafangkou by Oku and was compelled to retreat hastily northward.

The Japanese plans of campaign now called for a concentrated attack on Liao-Yang, where they hoped to fight the decisive battle of the war. For this purpose Generals Kuroki, Oku, and Nodzu (commander of a fourth army) united. In the battle which followed the Russians and Japanese were drawn up in two arcs. The Russian, 20 miles long, had its base at Liao-Yang; the second line, under command of Stackelberg, rested on Hsin-Min-Tun hill. The Japanese, 70 miles long, was in front of the city. The Russians had about 200,000 men and 650 guns, the Japanese 220,000 men and 700 guns. On August 26 the Japanese attacked along the entire line and drove the Russian right back on the city. The left was turned in an unsuccessful attempt to cut off the retreat to Mukden. The Japanese were victorious along the whole line under cover of the artillery and entered the city on September 4, but their troops were too exhausted to press the pursuit. The Russian loss is estimated at 16,000 officers and men and the Japanese from 18,000 to 20,000.

In October, after the formation of a second Manchurian army, the Russians determined to take the offensive and gradually work their way southward. This movement was checked at the battle of the Sha River, which the Russians had crossed. The armies were drawn up in parallel lines, the Russian rear resting on the Sha. As Kuropatkin was forced to weaken his right wing to protect his centre, Nodzu took advantage of the move and Kuropatkin was compelled to retreat after losing approximately 25 per cent of his army of 60,000 men. A return offensive movement under General Gripenberg (battle of Hei-ku-tai, Jan. 25–26, 1905) was nearly successful, but upon the arrival of Japanese reënforcements was abandoned, with a loss of 10,000 men.

While the Russians were being pushed further from the seaboard, General Nogi was engaged in the reduction of Port Arthur. The army with the aid of the fleet occupied, one by one, all the positions commanding the fortress (August-October). During December the ad-

vanced positions of the fort itself were taken with considerable losses and on Jan. 2, 1905, the terms of capitulation were signed. Approximately 41,500 Russians under the command of General Stoessel surrendered.

The final battle of the war was that which resulted in the fall of Mukden. This was the most tremendous battle in history up to that time. The Russians were drawn up before the city in the shape of a crescent. The Japanese aim was to fold in the points of the crescent and form a circle with the entire Russian army and Mukden in the centre. Kuropatkin determined the plan of attack by weakening his right wing in order to cover his retreat. The Japanese, taking advantage of this, attacked the Russian right in force and finally compelled Kuropatkin to withdraw his left and centre across the Hun River to prevent the enveloping movement the Japanese were attempting. The task was hopeless for the Russians. Kuropatkin was forced to fall back upon the city and, as Nogi had pierced his centre (which permitted the retreat of the left wing), his retreat was cut off. Mukden was entered by the Japanese on March 10. The Russian losses were over 90,000, the Japanese 40,000 to 50,000. This practically ended the continental campaign. During July the Japanese occupied the Russian island Sakhalin (q.v.).

Treaty of Portsmouth. At the instigation of Theodore Roosevelt, President of the United States, commissioners from both the belligerents met at Portsmouth, N. H., in August–September, 1905, and concluded a treaty of peace which was ratified on October 14 by the emperors of Russia and Japan. The chief provisions were: Russia transferred Port Arthur and adjacent territory to Japan; Russia recognized the paramount interest of Japan in Korea; Manchuria was to be restored to China; the portion of Sakhalin south of the fiftieth parallel of latitude was ceded to Japan.

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RUS'SO-TURK'ISH WAR (1877–78). A conflict between Russia and the Ottoman Empire, growing out of the condition of the Balkan countries and involving an effort on the part of Russia to extend her dominion in the direction of the Mediterranean. (See EASTERN QUESTION.) In 1875–76 risings against Turkish misrule broke out in Bosnia and Herzegovina. Encouraged by Servia and Montenegro, and probably by Russia, the spirit of revolt spread. The Bulgarian atrocities in May, 1876, called the attention of the Western Powers in a forcible manner to the state of affairs in the Balkan provinces. Gortchakoff, Andrassy, and Bismarck drew up the so-called Berlin Memorandum, but the failure of England to indorse it prevented the diplomatic representations made at Constantinople from having any result. Servia and Montenegro began open war against the Porte in July, 1876. England supported the Porte in spite of the vigorous assaults upon the Turkish policy by Gladstone. Austria-Hungary and Germany avoided committing themselves to any policy. The Magyars openly expressed sympathy with the Turks. Servia succumbed to the overwhelming forces of Turkey in October, but the Montenegrins, assured doubtless of Russian support, kept the field. In July, 1876, Alexander II and the Emperor Franz Joseph held a secret conference at Reichstadt at which it was decided that both Russia and Austria should continue to be neutral for some time; but under the pressure of popular excitement in Russia, where the Panslavists were very active, the Russian government concluded a treaty with Rumania in April, 1877, and, announcing herself as the protector of the Balkan Christians, declared war against the Ottoman Empire on the 24th. The advance of the Russians was rapid. The Danube was crossed at Galatz, on June 22, by a portion of the forces, and on June 27 the main army crossed at Simnitza into Bulgaria. In July the Czar joined the army in the field of operations. General Gurko took possession of Tirnova on July 7 and a week later he crossed the Balkans. The Russian lines faced eastward towards Rustchuk, Rasgrad, and Shumla; southward from Tirnova to the Shipka Pass; and westward towards the Osma and Vid rivers. The Turkish Army of the Danube on the east was commanded by Mehemet Ali; Reuf Pasha commanded the Army of the Balkans, to which was intrusted the defense of the Shipka Pass, but was soon superseded on account of inefficiency by Suleiman Pasha. Osman Pasha took up a strong position at Plevna (q.v.) on the right flank of the Russians. The unexpected and desperate resistance offered by Osman Pasha arrested the Russian advance. On July 30 he beat back a division of the army of the Grand Duke Nicholas, under General Krüdener, with great slaughter. Early in September the attack was renewed in great force by the Russians and Rumanians, but Osman held his own, and a desperate assault on the 11th proved disastrous to the assailants. The Russians then decided to invest the place. In the meanwhile General Gurko, who had been advancing upon Adrianople, was defeated by Suleiman Pasha at Eski-Zagra and driven into the Shipka Pass, where he succeeded in holding his ground against the furious attacks of Suleiman. In August and September Mehemet Ali operated successfully against the Russian left under the Crown Prince Alexander in the region of the river Lom. Everything now depended upon the ability of Osman Pasha to hold out at Plevna. General Gurko was sent to operate in the rear of the place and his successful movements rendered relief impossible. On December 10 Osman Pasha made a desperate attempt to break through the Russian lines, but was forced to surrender. Suleiman Pasha, who had succeeded Mehemet Ali in the command of the Turkish army in the east, was at first successful, capturing Elena on December 4, but on December 12 he suffered a defeat at Metchka, which drove him from the field. The fall of Plevna enabled the Russians to undertake a

rapid advance towards Adrianople. General Gurko entered Sofia on Jan. 4, 1878. On January 9 Generals Mirski, Skobelev, and Radetzky captured the Turkish forces in the Shipka Pass. The army of Suleiman Pasha, who attempted to check the Russian advance, was shattered in three days' fighting near Philippopolis, and on January 20 Adrianople was in the hands of the Russians. Servia had declared war on Dec. 14, 1877. On Jan. 10, 1878, the Servians took Nish and on the same day Antivari fell into the hands of the Montenegrins.

In Armenia the Russians had been equally successful. Four columns crossed the frontier on April 24, 1877, Loris-Melikov (q.v.) being in charge of the campaign. The first, moving on Batum, was driven back; the second stormed Ardahan on May 17; the third besieged Kars and also advanced on Erzerum, but was checked by Mukhtar Pasha, the Turkish commander in Armenia, and retired to Alexandropol; the fourth took Bayazid, but, losing the support of the third, was forced to abandon it and retreat. Here, as in Europe, the Russians underestimated their opponents at the outset. In October the campaign was renewed. Mukhtar Pasha was completely defeated by the Grand Duke Michael at Aladja Dagh on October 15 and retreated upon Erzerum, which he held until after the close of hostilities in Europe. Kars fell on November 18.

By the end of January, 1878, the Russians had advanced to the neighborhood of Constantinople and the Ottoman Empire was at the mercy of the enemy. On Jan. 31, 1878, an armistice was signed by which the Porte gave up all fortified places north of a line drawn from San Stefano on the Sea of Marmora to Derkos on the Black Sea. The Treaty of San Stefano between Russia and the Ottoman Empire was signed March 3, 1878. In the meanwhile, on February 13, a British fleet had entered the Sea of Marmora in order to guard against any intention on the part of the Russians to enter Constantinople. The Powers, unwilling to accord to Russia the aggrandizement involved in the Treaty of San Stefano, intervened (England even going so far as to embark a force of Sepoys for service against the Russians) and a congress was called at Berlin to revise the treaty and effect a new settlement of the Eastern Question. See BERLIN, CONGRESS OF.

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RUSSWURM, LUDWIG VON GLEICHEN-. See GLEICHEN-RUSSWURM, LUDWIG, BARON VON.

RUST (AS. *rust*, OHG. *rost*, Ger. *Rost;* connected with Lat. *rubigo*, rust, and with Lat. *rufus, ruber*, Gk. *ἐρυθρός, erythros*, Skt. *rudhira*, red). Parasitic fungi (Uredinales, q.v.), especially injurious to wheat, oats, and other cereals, usually appearing as yellow, brown, or black lines and spots on the leaves and stems. The name is often applied with various qualifications, as white rust, etc., to diseases of other plants, but as commonly regarded by botanists it applies only to the Uredinaceæ. Nearly all cereals are subject to the attack of rust, and from an economic standpoint this is one of the most serious pests of grain crops. In 1891, a season especially favorable to the rusts, the estimated loss to wheat, barley, rye, and oats in Prussia, as stated by a commission, was over $100,000,000. In Australia, it is said, the loss to the wheat crop is $10,000,000 to $15,000,000 annually, and in the United States it is equally great or even greater, for seldom is a field entirely free from it and sometimes a considerable portion of the crop is destroyed. As generally understood the most common and destructive species, at least in the United States, are *Puccinia graminis* and *Puccinia rubigo-vera* on wheat, oats, barley, and rye, and *Puccinia coronata* on oats. In the summer of 1915 *Puccinia glumarum*, the yellow rust of Europe, was found on wheat in several localities of the western United States. Investigations conducted in the United States and Sweden have shown that there are specialized forms of the first two species that occur only upon certain host plants. All of these species normally pass through three stages in their life cycles—uredospore and teleutospore stages upon cereals and an æcidial stage upon some very dissimilar plant. Having two distinct species of host plants on which different portions of the life cycle are passed is called heteroecism. For *Puccinia graminis* the æcidial stage is upon the barberry, for *Puccinia rubigo-vera* upon members of the borage family, and for *Puccinia coronata* upon the buckthorn (*Rhamnus lanceolata*) and related species. The æcidial phase of these rusts, being passed upon plants of little economic value, is not considered as injurious. The uredospore stage, called red, brown, or yellow rust, is passed upon the leaves and stems of the cereals; the black rust or teleutospore is the winter stage, in which the spores are thick-walled and remain in the dead leaves and stubble through the winter. The general facts regarding the life history of most rusts are the same, and that first discovered, *Puccinia graminis* of wheat, which was worked out by Debary in 1864, will serve as an example. Under normal conditions small cuplike depressions appear in the spring on both surfaces of the barberry leaves. The true cluster cups, as they are called, which appear upon the lower side of the leaves, are crowded with spores, which are blown about by the wind and, falling upon wheat, germinate and gain entrance into the tissues. Once inside, the mycelium develops with the growth of the wheat and about harvest time a crop of spores is produced. These red-rust spores are blown about and produce new rust spots wherever they alight upon a similar plant, causing injury by dwarfing the plant and shriveling the grain. Later in the season black lines of spores are produced upon stubble or the leaves of plants that remain. The thick-walled, two-celled resting spores produced at this time will not germinate until they have hibernated, but in early spring they germinate, forming what are called basidiospores, or sporidia, which attack barberry plants. Thus the life cycle is completed. Eriksson says rusts may be trans-

mitted through seed by what he calls mycoplasm, while a number of investigators have found spores just under the epidermis of the embryo of the seed. In some rusts the æcidial stage is omitted or unknown, only the uredospore and teleutospore forms being found. In addition to *Puccinia* there are a dozen or more genera of rusts, and no group of plants has as many forms of reproduction as have the rusts, at least half a dozen different kinds of reproductive organs being known. Heterœcism is common to most rusts.

While progress seems to have been made in combating many plant diseases by means of fungicides, etc., little has been accomplished in the prevention of wheat rust in spite of the attention and study given to this problem. While apparently no variety is wholly exempt, there is great variation in the susceptibility of different varieties. As a rule the hard red wheats, the leaves and stems of which have a decided bloom, are more resistant than others, and resistant varieties will probably be developed along this line, as also in the breeding of early-ripening varieties, which largely escape injury. Since late sowing upon moist soils almost always results in a badly rusted crop, such should be avoided. See Uredinales, and Plate of Fungi, Types of.

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RUST, George. See Cambridge Platonists.

RUS'TAM. A legendary Iranian hero, whose adventures are related in the *Shāh-Nāmah* of Firdausi (q.v.). Before reaching manhood he entered the fortress of Sipend in disguise and avenged the murder of his great-grandfather Nariman. His father, Zal, made Rustam a Pahlavan or hero of the realm. After some years, on the death of Garshasp or Keresaspa, Rustam was commissioned to offer the crown of Zabulistan to Kai Kobad. This accomplished, he defeated with the help of the new sovereign the armies of the Turanian chief Afrasyab, upon which the Turanian King, Pashang, sued for peace. During the reign of Kai Kaus, the successor of Kai Kobad, the hero performed seven adventures to deliver his King from the ruler of Mazanderan. Losing his horse Raksh, Rustam visited the city of Samangan to recover it. There he wedded the Princess Tahminah. On departing he left a bracelet as a token of recognition for his unborn child. This son, Suhrab, was brought up unknown to his father and became a famous warrior on the Turanian side, being finally slain by Rustam. The hero finally met his death in a pit filled with javelins into which he had been enticed by his brother Shaghad, but he lived long enough to shoot a fatal arrow at the traitor. The Rustam cycle is not found in Iranian literature until a comparatively recent period. The legend was known, however, at least in part, as early as the seventh or eighth century. Consult Matthew Arnold's poem *Sohrab and Rustum* and E. G. Browne, *Literary History of Persia* (2 vols., London, 1906–09).

RUSTCHUK, RUSCHUK, or **RUŠČUK,** rụs'chụk. A town of Bulgaria, on the Danube, opposite the Rumanian Giurgevo, 139 miles northwest of Varna (Map: Balkan Peninsula, F 3). It is an important manufacturing centre, producing tobacco and cigars, soap, beer, and good pottery. Its trade is also considerable. Under the Turks Rustchuk was an important fortress. Pop., 1900, 32,661; 1910, 36,255.

RUSTIC (or Rusticated) **WORK** (Lat. *rusticus*, relating to the country, from *rus*, country) and Rustication. The name of that kind of masonry in which the various stones or courses are marked at the joints by splays or grooves. The projecting surface thus left is sometimes called bossed, if the surface is entirely or comparatively dressed, and rustic when left rough and irregular or made artificially irregular. Rustication occurs chiefly in Renaissance architecture, both in the early Florentine and in the later baroque style, although rustic quoins were often used in rough Gothic work.

RUST MITE. See Orange Insects.

RUSTON. A city and the parish seat of Lincoln Parish, La., 30 miles west of Monroe, on the Chicago, Rock Island, and Pacific, and the Vicksburg, Shreveport, and Pacific railroads (Map: Louisiana, D 2). It is the seat of the Louisiana Industrial Institute and the Louisiana Chautauqua and contains an orphanage (Methodist) and fine high-school and post-office buildings. Pop., 1900, 1324; 1910, 3377.

RÜSTOW, rụ'stō, Wilhelm (1821–78). A Prussian soldier and writer, born at Brandenburg. Because of the liberal views in his pamphlet, *Der deutsche Militärstaat vor und während der Revolution* (1850–51), he was court-martialed, but managed to escape before sentence was pronounced on him. He settled in Zurich, where he lectured at the university on military science. In 1860 he joined Garibaldi in Sicily and distinguished himself. Upon his return to Zurich he resumed his military studies and became one of the most celebrated of modern writers on military science. His numerous writings include: *Geschichte des griechischen Kriegswesens* (1852–55); *Der Krieg von 1805 in Deutschland und Italien* (1853; 2d ed., 1859); *Der Krieg und seine Mittel* (1856); *Die Feldherrnkunst des 19. Jahrhunderts* (1857; 3d ed., 1877); *Die ersten Feldzüge Bonapartes in Italien und Deutschland* (1867); *Die Grenzen der Staaten* (1868); *Strategie und Taktik der neusten Zeit* (1872–75); *Kriegspolitik und Kriegsgebrauch* (1876).

RUSTRE, rŭs'tẽr. In heraldry, one of the subordinaries. See Heraldry.

RUTABAGA. See Turnip.

RUTE, rụt, Madame de Solms-Rattazzi-de. See Bonaparte, Lætitia Marie Wyse.

RUTEBEUF, rụt'bẽf' (c.1220–c.85). A French poet of the thirteenth century. His real name is not known. He wrote, often satirically, about the foibles of his time, rebuking monks and nuns, confessing his own sins, and speculating upon life and death. Some of his ideas reappear in Villon two centuries later. Besides his satirical poems, Rutebeuf wrote a number of fabliaux and *Le Miracle de Théophile*, a sort of miracle play. Rutebeuf has the merit of a clear style, which is spicy and original when he is really interested. His *Works* have been edited, with a *Life*, by Jubinal (new ed., Paris,

1874–75). Consult also: Clédat, *Rutebeuf* (Paris, 1891); Kressnel, *Rutebeuf, ein französischer Dichter des XIII. Jahrhunderts* (Cassel, 1894); J. Bédier, *Les fabliaux* (1893).

RUTENA. See RODEZ.

RUTGERS, rŭt'gẽrz, HENRY (1745–1830). An American patriot and philanthropist, born in New York City. He graduated at King's College (now Columbia University) in 1766, at the outbreak of the Revolution entered the Continental army, in 1776 took part as a captain in the battle of White Plains, and after the war became successively major and colonel of New York militia. He was elected to the Assembly as a Republican in 1784, 1800, 1801, 1802, and 1807. From 1802 to 1826 he was a regent of the University of the State of New York. In 1819 he was a member of a committee organized with a view to perfecting a method for checking the advance of slavery. He is best known as the benefactor of Rutgers College (q.v.).

RUTGERS COLLEGE. An institution for higher education at New Brunswick, N. J. The college received its first charter on Nov. 10, 1766, and its second on March 20, 1770, from George III. Through William Franklin, Governor of the Province of New Jersey, it received the name of Queen's College, in honor of the royal consort Charlotte. In 1825 the name was changed to Rutgers College, in honor of Henry Rutgers of New York City. The earliest effective promoter of the college was Theodorius Jacobus Frelinghuysen. A new site was acquired in 1809 and the present main building, still called Queen's, was erected. For many years the college maintained a covenant with the Reformed (Dutch) church and coöperated with the theological seminary of that church at New Brunswick. While such official connection has been severed, the provision of the charter that the president of the college shall be a member of that church still obtains. In 1863 the trustees organized as part of the college a scientific school. In 1864 the State of New Jersey declared it to be the State College for the Benefit of Agriculture and the Mechanical Arts. The United States government in 1888 established a college experiment station. The courses of study offered are the classical or liberal arts, leading to the degree of A.B., the literary, leading to the degree of Litt.B., and the scientific, leading to the degree of Sc.B. Courses in agriculture, biology, ceramics, civil engineering, mechanical engineering, and electrical engineering all lead to the degree of Sc.B. A summer school is maintained and courses in agriculture are given. Graduate courses are also given. In 1906 the Neilson campus was given by James Neilson. There is a college farm of 100 acres 1 mile from the college campus. The entire property was in 1915 valued at about $1,500,000. The endowment amounted to about $750,000. In the library were 80,000 volumes. The faculty includes 55 professors and instructors, besides special teachers. During the year 1915–16, 475 students were enrolled in undergraduate courses, 500 in the summer school, over 200 in short courses, 20 in graduate courses, a total of about 1200. The president in 1915 was W. H. S. Demarest.

RUTH (Heb. *Rūth*, friend), BOOK OF. One of the canonical books of the Old Testament, belonging to the third division of the Hebrew Canon (the Hagiographa). It relates events of the time of the Judges and in the English Bible, as in the Greek version and the Latin Vulgate, follows the Book of Judges. The Book of Ruth tells how Elimelech, with his wife, Naomi, and his two sons, Mahlon and Chilion, left their home in Bethlehem because of a famine and settled in the land of Moab. There the sons married Moabite women, Ruth and Orpah. Elimelech and his sons died and Naomi decided to return to her native land. She advised her daughters-in-law to remain in Moab and remarry. Orpah complied, but Ruth declared that nothing but death should separate her from Naomi. The two women came to Bethlehem and there Ruth gained favor with Boaz, a kinsman of Elimelech and one of the leading men of Bethlehem. She claimed his protection as a kinsman, at the instigation of Naomi. Boaz was willing to accept the responsibility, but in accordance with custom, a nearer kinsman must be consulted. Summoning the elders of the city as witnesses, Boaz called upon this kinsman to redeem Elimelech's patrimony, which poverty compelled Naomi to sell, involving the duty to marry Ruth in order to "raise up the name of the dead upon his inheritance." The kinsman resigned his rights in favor of Boaz, and accordingly the latter married Ruth, and their first-born son, Obed, became the grandfather of David.

Opinions as to the date and purpose of the Book of Ruth differ. It has been called a religious romance, a purely fictitious narrative told in order to point to a moral, and included in the canon mainly because of the reference at the end to the genealogy of David. The aim of the writer is thought to have been to protest against the tendency, represented in the books of Ezra and Nehemiah, to condemn marriages between Hebrews and surrounding nations. If David, the ideal Jewish King, were descended from a Moabite woman, mixed marriages could hardly be the unqualified evil which the legalists of Ezra's day represented them to be. The declaration of Ruth that Naomi's God shall be her God and Naomi's people her people (i. 16) is understood by some as a bold protest against the exclusive conception of Yahwe as the God particularly of a single people, and is thought to reflect the theory of universal monotheism of the postexilic prophets; while others find in it a reflection of that willingness to accept proselytes from other nations which characterizes the fully developed monotheistic faith. On either view the book is certainly postexilic and may be considerably later than the time of Ezra. It is thought by other scholars that the purpose of the writer was to supply information concerning the ancestry of David, omitted in the books of Samuel, or to urge the duty of the next of kin to marry a childless widow. Consult the commentaries of Wright (London, 1864), Keil (with Judges, 2d ed., Leipzig, 1874; Eng. trans., New York, 1865), Bertheau (with Judges, 2d ed., ib., 1883), Oettli (*Die geschichtlichen Hagiographen*, Munich, 1889), Wildeboer (Freiburg, 1898), Bertholet (ib., 1898), and Nowack (Göttingen, 1900); also the Old Testament introductions of Reuss, F. E. König, Bleek-Wellhausen, C. H. Cornill, S. R. Driver (2d ed., 1910), and Sellin (2d ed., 1913).

RUTHE'NIANS, or RUSS'NIAKS. A Slavic people of the eastern group, forming a branch of the Little Russians. They live chiefly in Galicia. The height of the Ruthenian plainsmen of Galicia is 1.640 meters; their cephalic

index, 83.4; the height of the Ruthenian highlanders is from 1.666 to 1.670 meters; their cephalic index, 83.6. Chestnut hair and brown eyes characterize about half of the population; the remainder have dark skin and hair. The Ruthenians in Galicia number about 3,500,000, and there are over 400,000 in Hungary and 300,000 in Bukowina. See UKRAINIANS; GALICIA.

RUTHE'NIUM (Neo-Lat., from *Ruthenia*, a name of Russia). A metallic chemical element, discovered by Claus in 1845. Osann in 1828 announced his discovery of three new metals in the platinum ores from the Urals, giving the name "ruthenium" to one of these metals. The announcement of this discovery he subsequently withdrew, and the existence of the new metal was not accepted until the subject was again studied by Claus, who proved its existence, retaining the old name. It occurs in its metallic state in platinum ores and in iridosmium, also as the sulphide in the mineral laurite. The metal is separated from iridosmium as the oxide by a complicated chemical process and is then reduced in a graphite crucible and fused by the oxyhydrogen flame.

Ruthenium (symbol, Ru; atomic weight, 101.7) is a white, lustrous, hard, heavy, brittle metal that melts at upward of 2500° C. (4530° F.). It combines with oxygen, forming a monoxide, a sesquioxide, a dioxide, a trioxide, a heptoxide, and a tetraoxide, of which the trioxide and the heptoxide are known only in combination. These oxides form various salts, none of which is of any commercial importance.

RUTHERFORD, rŭth'ĕr-fôrd. A borough in Bergen Co., N. J., 9 miles north by west of Jersey City between the Passaic and Hackensack rivers, and on the Erie Railroad (Map: New Jersey, D 2). Many New Yorkers have their residences here. Pop., 1900, 4411; 1910, 7045; 1915, 8347.

RUTHERFORD, ALEXANDER CAMERON (1855–). A Canadian statesman. He was born in Carleton County, Ontario, and was educated at Woodstock College and McGill University. Called to the bar in 1885, he practiced law in Ottawa until 1895, when he removed to Alberta. After several years' municipal service in the town of Strathcona, he was elected a Liberal member of the Alberta Legislature in 1902. He was Premier of Alberta in 1905–10.

RUTHERFORD, ALISON. See COCKBURN, ALICIA.

RUTHERFORD, SIR ERNEST (1870–). A British physicist, born in Nelson, New Zealand. He was educated at Nelson College, at Canterbury College (Christchurch), New Zealand University, and at Trinity College and Cavendish Laboratory, Cambridge. He delivered the Bakerian lecture of the Royal Society in 1904 and received the society's Rumford medal in 1905 and the Barnard medal in 1910. He had been professor of physics at McGill University from 1898 to 1907, when he became Langworthy professor and director of the physical laboratories at the University of Manchester. In 1908 he received the Bressa prize from the Turin Academy of Sciences and the Nobel prize, and in 1914 he was knighted. His particular field was radioactivity (q.v.), in which he worked with F. Soddy (q.v.). He wrote: *Radio-Activity* (1904); *Radio-Active Transformations* (1906); *Radio-Active Substances and their Radiations* (1913).

RUTHERFORD, MARK. The pen name of WILLIAM HALE WHITE (1831–1913), an English novelist. His *Autobiography of Mark Rutherford* (1881), *Mark Rutherford's Deliverance* (1885), and *The Revolution in Tanner's Lane* (1887) were at first coolly received, but their literary quality and other merits brought later a more general and generous appreciation. Their author, born at Bedford, was educated to be a Nonconformist minister, but, because of a change in his religious views, he gave up this career. Journalism and a clerkship in the Admiralty occupied him instead. His sketches of parliamentary life, originally written for the *Illustrated Times*, were collected in *The Inner Life of the House of Commons* (1897). In addition to the books named he was also the author of: *Spinoza's Ethic* (1883); *Miriam's Schooling and Other Papers* (1890); *Catherine Furze* (1893); *Clara Hopgood* (1896); *Pages from a Journal, with Other Papers* (1900); *John Bunyan* (1904); *The Early Life of Mark Rutherford by himself* (1913). Posthumously appeared, edited by his wife, *Last Pages from a Journal, with Other Pages* (1915).

RUTHERFORD, SAMUEL (1600–61). A Scottish divine. He was born in the Parish of Nisbet, Roxburghshire, graduated from Edinburgh University in 1621, and in 1626 turned to the study of theology, becoming pastor of Anwoth. For his *Exercitationes Apologeticæ pro Divina Gratia* (1636) he was charged with nonconformity to the Acts of the Episcopacy, was forbidden to preach, and was banished to Aberdeen. His exile ended with the covenanting revolution 18 months later. In 1638 he was appointed professor of divinity at St. Mary's College, St. Andrews, and in addition became a colleague to Robert Blair in one of the city churches. He was appointed rector of his university in 1651. From 1650 to the end of his life he was engaged in controversy more or less bitter with any who did not take the rigid view of covenanting. After the Restoration he lost his official positions. Little of his work has been preserved except his *Letters*, edited by A. A. Bonar (5th ed., London, 1906), and *The Upward Way: A Book of Extracts from the Letters of Samuel Rutherford, Written Chiefly from his Prison* . . . edited by E. C. Gregory (London, 1908), and his *Sermons* (reprinted 1876–85). Consult his *Life*, by A. A. Bonar, in the *Letters* referred to above; also: T. Murray, *Life of Samuel Rutherford* (Edinburgh, 1828); A. T. Innes, *Samuel Rutherford* (ib., 1884); A. Thomson, *Samuel Rutherford* (London, 1884); Alexander Whyte, *Samuel Rutherford and Some of his Correspondents* (Edinburgh, 1894).

RUTHERFORD, WILLIAM GUNION (1853–1907). An English classical scholar, born in Peeblesshire and educated at St. Andrews University and Balliol College, Oxford. He was classical master at St. Paul's School from 1876 till 1883, when he succeeded Dr. Charles Brodrick Scott as head master of Westminster School; here he remained until 1901. His more important publications comprise: *The New Phrynichus* (1881), a comprehensive treatise on the history and distinctive characteristics of Attic Greek; an edition of the *Fables of Babrius* (1883), with a dissertation on the history of the Greek fable; and *Scholia Aristophanis* (2 vols., 1896; vol. iii, 1905). He also published several other works relating to the classics, among them a *First Greek Grammar* and *A Chapter in the History of Annotation* (vol. iii of his *Aris-*

tophanes, 1905). Consult J. E. Sandys, *A History of Classical Scholarship*, vol. iii (Cambridge, 1908).

RUTHERFURD, Lewis Morris (1816–92). An American astronomer, born in Morrisania, N. Y. He graduated at Williams College in 1834 and became a lawyer. From 1849 he devoted his spare time to astronomy and built in New York an observatory which was the primary station for longitude determination. Two years after the construction of the observatory, in 1858, he first attacked the problem of astronomical photography. Interrupting his research in this direction, about 1862 he began his studies in spectroscopy, following the suggestions of Fraunhofer; distinguished the star spectra by a classification practically identical with Secchi's, and if not prior to Donati, gaining results far more minute and accurate. He constructed a large spectroscope late in 1863 and about the same time realized the advantage of diffraction gratings over bisulphide prisms. For several years he studied Nobert's gratings and finally greatly improved on them. His telescope especially constructed for photography was finished in 1864, a photographic corrector was made in 1868, and in 1876 he devised a glass circle for measuring angles. In 1883 he gave up active work. Many of his valuable photographs were published by Rees in 1891.

RUTHERGLEN, rŭth'ĕr-glĕn *or* (locally) rŭg'len. A royal, parliamentary, and municipal burgh in Lanarkshire, Scotland, on the Clyde, 3 miles southeast of Glasgow (Map: Scotland, D 4). It was an important town in the twelfth century. It has extensive iron and steel works and neighboring coal mines. It contains an old church of the twelfth century and a fine town hall. Pop., 1901, 18,280; 1911, 24,319.

RUTHVEN (rŭth'ven *or* rĭv'en) **RAID.** See Gowrie Conspiracy.

RUTILE, rōō'tīl *or* rōō'tēl (Fr. *rutile*, from Lat. *rutilus*, reddish, yellowish red). A mineral, titanium dioxide, that crystallizes in the tetragonal system and is of a reddish-brown color. It is found in older rocks in various localities in Norway, in Sweden, in the Urals, and in Switzerland; also in the United States. When found as fine needle-like crystals in limpid quartz they are called sagenite, Venus's-hair-stone, or flèches d'amour.

RUTIL'IUS NAMA'TIA'NUS, Claudius. A Latin poet of the beginning of the fifth century, a Gaul by birth, but a Roman in sentiment, and under Honorius prefect of Rome. His poem *De Reditu Suo* (416) describes his trip from Rome to Gaul. A part of the first and most of the second book are lost. It was edited by Müller (1870) and by Bährens (in *Poetæ Latini Minores*, vol. v, 1883).

RÜTIMEYER, rʏ'tē-mī'ĕr, Ludwig (1825–95). A Swiss paleontologist, born at Biglen in the Emmenthal. He studied theology, later medicine at Bern and natural history in Paris, London, and Leyden, became professor of zoölogy and comparative anatomy at Basel in 1855, and made important studies on the early fauna of Switzerland and on craniology. His many and valuable works include: *Beiträge zur Kenntnis der fossilen Pferde* (1863); *Crania Helvetica* (1864), with His; *Ueber die Herkunft unserer Tierwelt* (1867); *Ueber Thal- und Seebildung* (1869; 2d ed., 1874); *Die Veränderungen der Tierwelt in der Schweiz seit Anwesenheit des Menschen* (1875); *Die Rinder der Tertiärepoche* (1878–79); *Beiträge zu einer natürlichen Geschichte der Hirsche* (1881-83); *Die eocane Säugetierwelt von Egerkingen* (1891).

RUT'LAND. The smallest county in England (Map: England, F 4). Area, 152 square miles; pop., 1901, 19,700; 1911, 20,347. It is divided into two portions, of which the northern is a somewhat elevated table-land, while the southern consists of a number of valleys running east and west and separated by low hills. The principal stream is the Welland, forming the boundary on the southeast. The chief mineral production is fine building stone. The climate is mild and healthful, the soil loamy and rich. Oxen and sheep are raised in great numbers. The capital is Oakham.

RUTLAND. A town, including several villages, in Worcester Co., Mass., 12 miles northwest of the city of Worcester, on the Boston and Maine Railroad (Map: Massachusetts, D 3). It has the Rutland State Sanatorium, a prison camp and hospital, several private sanitariums, and a public library. Pop., 1900, 1334; 1910, 1743. Rutland was settled about 1716 and made a town in 1722. In 1777–78 part of Burgoyne's troops, who had surrendered at Saratoga, were quartered here. Rutland was the home from 1781 to 1787 of Rufus Putnam (q.v.). Consult Hurd (ed.), *History of Worcester County, Mass.* (Philadelphia, 1889), and a chapter in Powell (ed.), *Historic Towns of New England* (New York, 1898).

RUTLAND. A city and the county seat of Rutland Co., Vt., 68 miles south by east of Burlington, on Otter Creek and on the Delaware and Hudson, the Clarendon and Pittsford, and the Rutland railroads (Map: Vermont, C 6). Some of the loftiest, most picturesque peaks in the Green Mountains are near. Noteworthy features of Rutland include Memorial Hall, the public and the H. H. Baxter libraries, Knights of Pythias home, house of correction, United States government building, the county courthouse, city hall, and city hospital. The city is primarily important for its extensive marble-quarrying industry, the quarries hereabout being among the most productive in the world. There are also railroad repair shops, scale works, lumber mills, machine shops, boiler and engine works, and manufactories of brick, furniture, silos, fire clay, creamery supplies, shirts, ladies' wrappers, skirts, maple-sugar utensils, cheese, etc. Pop., 1900, 11,499; 1910, 13,546; 1914 (U. S. est.), 14,417; 1920, 14,954.

Rutland was chartered by New Hampshire in 1761, but not settled until nine years later. Along with the rest of the State it was claimed for many years by both New Hampshire and New York and in 1772 the latter rechartered it as Socialborough. This name, however, seems never to have been used. Until 1804 Rutland was one of the two State capitals. In 1892 Rutland was chartered as a city. Consult Williams, *Centennial Celebration of the Settlement of Rutland* (Rutland, 1870).

RUTLAND, John James Robert Manners, Duke of. See Manners.

RUT'LEDGE, Edward (1749–1800). An American patriot, born at Charleston, S. C. Prominent as a lawyer, he was a member of the Continental Congress (1774–77), was one of the signers of the Declaration of Independence, served on the first Board of War in 1776, and in the same year was a joint commissioner with John Adams and Franklin to treat with

Lord Howe with regard to peace. He was taken prisoner near Charleston in 1780 and confined at St. Augustine for 11 months. From 1798 until his death he was Governor of South Carolina.

RUTLEDGE, John (1739–1800). An American statesman, born at Charleston, S. C. He studied law in London and began to practice at Charleston in 1761. He sat in the Stamp Act Congress at New York in 1765, in the South Carolina Convention in 1774, and the Continental Congress of 1774, was chairman of the committee which framed the new constitution for South Carolina in 1776, and was first President of the State under it (1776–78), and in 1779 was Governor. In 1780 he joined the Army of the South. He was a member of the Continental Congress again in 1782 and again in 1783, was Chancellor of his State in 1784, member of the convention which framed the Federal Constitution (1787) and of the State convention which adopted it. He was an associate justice of the United States Supreme Court (1789–91), was Chief Justice of South Carolina from 1791 to 1795, and in July, 1795, was appointed Chief Justice of the United States Supreme Court, but, owing to the loss of his reason, the appointment was not confirmed.

RÜTLI, rŭt'lē. A meadow in Switzerland. See Grütli.

RUT'TAN, Robert Fulford (1856–). A Canadian chemist. He was born at Newburgh, Ontario, was educated at Toronto University, and in medicine at McGill, and later studied at Berlin. At McGill he was lecturer in chemistry (1887–91) and professor of practical chemistry (1891–1902), chemistry (1902–08), and organic and biological chemistry (after 1908). He made noteworthy contributions on organic chemistry and chemistry as applied to medicine.

RU'TULI. An ancient Italian people on the coast of Latium, south of the mouth of the Tiber. In Vergil's *Æneid,* vii–xii, Turnus is their King and leads them against Æneas (q.v.) and the Trojans.

RUVETTO, rōō-vĕt'tô. See Escolar.

RUVO DI PUGLIA, rōō'vô dē pōō'lyȧ. A city in the Province of Bari, Italy, 20 miles west of Bari, with which it has steam tramway connection (Map: Italy, F 4). It is surrounded by walls, has a twelfth-century cathedral, a seminary, and a Gymnasium. The city is famous for its potteries. It trades in grain, pulse, and fruits. Pop. (commune), 1901, 23,776; 1911, 23,975.

RUWENZORI, rōō'wĕn-zō'rē. A mountain mass in Central Africa, on the boundary between the Belgian Congo and British East Africa and between Lake Albert and Lake Albert Edward (Map: Congo, F 2). It consists of several parallel ridges and groups of peaks. An area of 5 miles' radius from the centre is permanently covered with snow. Ruwenzori was discovered in 1888 by the Stanley expedition. In 1901 Wylde reached an altitude of 15,000 feet. On June 16, 1906, the Duke of the Abruzzi scaled the two highest peaks, which he named Alexandra (16,750 feet) and Margherita (16,816 feet). Consult F. de Filippi, *Ruwenzori* (London, 1908).

RUY BLAS, rwē' bläs'. A drama by Victor Hugo (1838). The hero's relative, Don César de Bazan, disappears, and Ruy Blas is forced to personate him at court, where he rises to power.

RUYSBROEK, rois'brŭk, or **RUSBROEK,** Jan van (1293–1381). A Dutch mystic. He was born at Ruysbroek, studied at Brussels, and became vicar of the church of St. Gudule in Brussels, but in 1343 he retired to the Augustinian monastery of Groenendael. From him dates the succession of mystical teachers in Germany and the Netherlands prior to the Reformation. He earned the name of *Ecstatic Teacher.* An edition of his works, which he wrote partly in Flemish and partly in Latin, was published in Hanover in 1848. *Reflections from the Mirror of a Mystic* appeared in 1906. Consult Maurice Maeterlinck, *Ruysbroek and the Mystics* (Eng. trans., new ed., London, 1908), and Vincent Scully, *A Mediæval Mystic* (New York, 1911).

RUYSCH, rois, Rachel (1664–1750). A Dutch flower and fruit painter, born in Amsterdam. She was a pupil of Willem van Aelst, married the portrait painter Jurian Pool in 1695, was received into the guild at The Hague in 1701, and became court painter to the Elector Palatine in Düsseldorf in 1708. Her reputation as a flower painter was second only to that of Jan van Huysum. She excelled particularly in painting rare exotic flowers and insects. Two admirable pieces (dated 1700 and 1715) are in The Hague Museum, a fine fruit piece and four others in the Pinakothek at Munich, four in Amsterdam, and others in Karlsruhe, Berlin, Dresden, Vienna, and the Metropolitan Museum, New York.

RUYSDAEL, Jacob. See Ruisdael.

RUYSDAEL, rois'dȧl, or **RUISDAEL,** Salomon (c.1600–70). A Dutch landscape painter, uncle of Jacob, born at Haarlem. He was possibly a pupil of Esaias van de Velde and Jan van Goyen and passed most of his life in Haarlem, where he became a member of the Painters' Guild in 1623 and one of the board of directors in 1648. His art closely resembles Jan van Goyen's, but is more uniform and more vigorous in color. He preferred sylvan landscapes with rich accessories. Characteristic landscapes are in the galleries of Berlin, Dresden, Munich, Vienna, and Stockholm, in the Metropolitan Museum (New York), the New York Historical Society, and the Widener (Philadelphia) and other private collections in America.

RUYTER, roi'tēr, Michael Adriaanszoon de (1607–76). A Dutch admiral, born at Flushing. He went to sea as a boy and rose to be captain of a vessel employed for the protection of Dutch commerce. In 1641 he was made rear admiral of a squadron dispatched by Holland to the aid of the Portuguese against the Spaniards. In 1647 he rendered effective service against the Barbary pirates. When war between Holland and England broke out in 1652, Ruyter was placed in command of a fleet of some 35 ships. He was under Maarten Tromp when the latter defeated Blake in the Channel and participated in the three days' battle with Blake near Portland (Feb. 28–March 2, 1653). In the second war against the English Ruyter received the chief command, and was disastrously defeated in July, 1666. In 1667 Ruyter's victories helped towards the conclusion of peace at Breda (1667). He fought a drawn battle with the French under Duquesne off Stromboli (Jan. 8, 1676), but was defeated near Mersena (April 21). He made good his retreat, but his legs were shattered

in the engagement, and he died April 29. Consult Liefde, *The Great Dutch Admirals* (London, 1873), and Grinnel-Milne, *Life of Lieutenant Admiral de Ruyter* (ib., 1896).

RUZSKY, Nicolas Vladimirovitch (c.1853–1915). A Russian soldier. He received his military education at the St. Petersburg (now Petrograd) Gymnasium, the Constantine Military Schools, and the Nicolas Academy of the General Staff. When only 18 years old he served as sublieutenant of the Grenadier Guards in the Turkish War. At 31 he was colonel and at 42 major general. During the Russo-Japanese War in 1904–05 he gained valuable experience as chief of staff in the Second Manchurian Army. Subsequently he became a member of the Army Council, and finally was in command of an army corps. After the outbreak of the European War he commanded the Russian forces that won a great victory over four Austrian army corps near Lemberg (q.v.) early in September, 1914. In recognition of this success he was made an honorary G.C.M.G. by the King of England and a Grand Officer of the French Legion of Honor. In 1915 he commanded the northern Russian armies near Riga, where his exertions undermined his health, so that he died in December of that year. See War in Europe.

RY'AN, Abram Joseph, best known as Father Ryan (1839–86). An American Roman Catholic priest, probably the most conspicuous poet of the Southern Confederacy. Shortly after ordination Ryan became chaplain in the Confederate army, served to the close of the war, and wrote not long after Lee's surrender his famous poem, "The Conquered Banner." He then served in New Orleans as priest and editor of the *Star,* a Roman Catholic weekly; founded in Augusta, Ga., the *Banner of the South;* then reassumed priestly duties in Mobile till 1880, when he visited the North to lecture and published in Baltimore *Poems, Patriotic, Religious, and Miscellaneous.*

RYAN, Patrick John (1831–1911). A prelate of the Roman Catholic church, born at Thurles, Ireland. He came to the United States in 1852 and began teaching in the Theological Seminary at St. Louis, Mo. In 1853 he was ordained priest and soon became rector of the cathedral. In 1872 he became Coadjutor Bishop of St. Louis, in 1883 Archbishop, and in 1884 was transferred to the see of Philadelphia. Among his published addresses are: *What Catholics Do Not Believe* (1877); *Some of the Causes of Modern Religious Skepticism* (1883); *Agnosticism* (1894). Consult his *Life* by Kerlin (Philadelphia, 1903).

RYAN, Thomas Fortune (1851–). An American financier, born in Nelson Co., Va. He was early engaged in the dry-goods business in Baltimore, but came to New York and established himself as a broker in 1870 and at the age of 23 was a member of the Stock Exchange. Thereafter he was active in the consolidation of street railways in New York, Chicago, and elsewhere, in the reorganization of steam railways in the South, and in the development of coal properties in Ohio and West Virginia. A controlling interest in the Equitable Life Assurance Society of New York, which he bought in 1905, paying $2,500,000 for 502 shares, he later sold to the elder J. P. Morgan. Indeed, in 1908 Ryan retired as officer or director in more than 30 corporations in which he was the controlling factor. He contributed largely to the expenses of Democratic political campaigns, including $450,000 to the presidential campaign of 1904. In 1912 he gave $1,000,000 to the Roman Catholic church. His membership in the Virginia delegation to the Democratic National Convention in 1912 brought a motion of expulsion from Bryan, who was apprehensive of control by the "interests."

RYAZAN, rē'ä-zän'y'. A government and a city of Russia. See Riazan.

RYAZHSK, ryäzhsk. An important railway centre in the Government of Riazan, Russia, situated 70 miles south of Riazan (Map: Russia, F 4). It has an extensive trade in grain. Pop., 1910, 15,451.

RYBINSK, rī'bĭnsk. A river port in the Government of Yaroslav, Russia, on the Volga, near its confluence with the Sheksna and the Tcheremakha, about 228 miles north-northeast of Moscow (Map: Russia, E 3). It is well built and is of great commercial importance. The chief manufactured product is flour. Pop., 1897, 25,200; 1910, 31,485.

RYDBERG, rĭd'bĕrg, Per Axel (1860–). An American botanist, born at Odh, Sweden. In 1891 he graduated from the University of Nebraska, where he was botanical assistant in 1894–95, and studied also at Columbia (Ph.D., 1898). He held, between 1884 and 1889, various teaching positions, and in the summers of 1891–96 he was field agent for the United States Department of Agriculture. He became assistant curator in 1899 and curator in 1907 of the New York Botanical Gardens. His publications include monographs on Physalis, Potentilleæ, and Saxifrageæ; *Catalogue of the Flora of Montana and the Yellowstone National Park* (1900); *Flora of Colorado* (1906).

RYDBERG, ryd'bârj, (Abraham) Viktor (1828–95). A Swedish author, born in Jönköping and educated at Växiö and at Lund. In 1855 he became an editor in Göteborg, in 1876 professor of the history of civilization in the University of Göteborg, whence in 1884 he went to Stockholm in a similar capacity. Two volumes of lyrics (1882, 1891) show unusual poetic form and originality of thought; but his historical novels are his chief claim to remembrance. The best known are *Fribytaren på Oestersjön* (1857); *Singoalla* (1858; Eng. trans., 1904); *Den siste athenaren* (1859); *Vapensmeden* (1891). His *Samlade Skrifter* were published in 14 volumes (5 of them lectures) (1896–1900). Consult: Schenck's biography (Marburg, 1896); Zachrisson, *Rydberg som uppfostrare* (Göteborg, 1897); for full biography and characterization, Karl Warburg, *Viktor Rydberg* (2 vols., Stockholm, 1900); also H. Hofberg, *Svenskt Biografiskt Handlexikon* (2 vols., ib., 1906).

RYDE, rīd. A fashionable watering place and market town on the north coast of the Isle of Wight, England, 5 miles south-southwest of Portsmouth (Map: England, E 6). It consists of Upper and Lower Ryde, the former anciently called *Rye* or *La Riche,* and the latter of modern construction. The pier, nearly a mile long, forms an excellent promenade. Yacht and boat building is carried on to some extent. Ryde is the largest town in the island. It was incorporated in 1868. Pop., 1901, 11,042; 1911, 10,608.

RY'DER, Albert Pinkham (1847–1917). An American landscape and figure painter. He

was born in New Bedford, Mass., and studied at the National Academy, New York. At its best his work possesses imaginative qualities of a high order. Free from foreign influence and the result largely of self-teaching, the technique is individual. Nature is rendered symbolically, with highly subjective interpretations. Among his best-known works are: "Spring," "Lowlands near High Bridge," "The Bridge," "The Forest of Arden," "The Curfew Hour," and "Smuggler's Cove," the last three in the Metropolitan Museum, New York. His idealistic and imaginative figure pieces include "Siegfried," "Jonah," and "The Flying Dutchman." Ryder made New York his residence. He was elected a member of the National Academy (1906) and of the National Institute of Arts and Letters.

RYDER, DUDLEY FRANCIS STUART. See HARROWBY, EARL OF.

RYE (AS. *ryge*, Ger. *Rocken, Roggen*, rye). Several species of the genus *Secale*, native to western temperate Asia and adjacent Europe. Common rye (*Secale cereale*), the only species in cultivation, does not seem to have been grown so long ago as the other common cereals, as it has not been found in Egyptian monuments and has no name in ancient languages. Its cultivation was known to the Romans in Pliny's time, but not to the ancient Greeks. Rye is extensively cultivated in northern Europe, in some parts of Asia, and to some extent in North America. It does not grow as far north as barley, but succeeds in regions too cold for wheat and on soils too poor for any other grain. It will ripen in colder latitudes than most other grains, but is most productive where wheat will ripen. It is adapted to light, sandy lands and does not thrive well on heavy, damp, humous soils. The varieties of rye, much less numerous than those of the other important cereals, may be classified into winter and spring varieties. The former, which are most frequently grown, are sown in autumn, the latter in spring. Cultural management is much the same as for other cereals. Winter rye is usually ripe in June. Rye is also frequently grown for green manuring on lands deficient in humus. A good crop of rye yields from 20 to 30 bushels of grain per acre. Russia is the greatest rye-producing country in the world, producing about 900,000,000 bushels annually, mostly in the northern and central provinces. The annual production of rye in the United States is about 40,000,000 bushels, with an average yield of about 16 bushels per acre. See Colored Plate of CEREALS.

Food and Feeding Value. In Europe rye ranks next to wheat as a breadstuff, but since its flour is darker than that of wheat and since the gluten of rye flour does not possess the same elastic and tenacious quality as that of wheat, rye bread is darker and more compact than wheat bread. When the grain is milled entire—the usual way—it contains more protein than wheat flour. Mixtures of wheat and rye flour and corn and rye are often made for bread making. Rye bread has the following average percentage composition: water, 35.7; protein, 9.0; fat, 0.6; nitrogen-free extract, 52.7; crude fibre, 0.5; ash, 1.5. The fuel value is 11.80 calories per pound. The "black bread" of Europe is made of rye, an especially dark form being known in north Germany as pumpernickel.

The various rye products have the following (average) percentage composition:

PRODUCTS	Water	Protein	Fat	Nitrogen-free extract	Crude fibre	Ash
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Whole	11.6	10.6	1.7	72.5	1.7	1.9
Flour	13.1	6.7	0.8	78.3	0.4	0.7
Bran	11.6	14.7	2.8	63.8	3.5	3.6
Shorts	9.3	18.0	2.8	59.9	5.1	5.9
Fodder	76.6	2.6	0.6	6.8	11.6	1.8
Hay	8.5	9.8	2.3	43.4	30.1	5.9

As regards composition, the rye grain does not differ materially from wheat. It has been urged that, as rye is often affected with ergot, it is not a wholesome food for animals. This objection cannot be urged of clean rye.

RYE. A small seaport town of Sussex, England, one of the Cinque Ports (q.v.).

RYE. A village in Westchester Co., N. Y., 8 miles northeast of New Rochelle, on the New York, New Haven, and Hartford Railroad (Map: New York City, Greater New York and Vicinity, H 1). It has a fine beach, on Long Island Sound, and enjoys some reputation as a summer resort. There are many fine homes, a seminary for girls, a public library, and a hospital. Pop., 1910, 3964; 1915, 5242. Rye was settled in 1660 and was organized as a town under the jurisdiction of Connecticut in 1665. The village was incorporated in 1904. The boundary line at this point between Connecticut and New York was long disputed, and Rye was included within the limits of the former until 1683 and again from 1697 to 1700. The Jay homestead is in Rye, and John Jay spent his early life here. Consult Baird, *Chronicle of a Border Town, History of Rye* (New York, 1871).

RYE GRASS (*Lolium*). A genus of grasses, having a two-rowed, flatly compressed spike, the spikelets appressed edgewise to the rachis. Common rye grass, ray grass, or perennial rye grass (*Lolium perenne*) is frequent in meadows and pastures, and is highly valued in Europe, where it is one of the popular grasses for forage and hay. In North America it is less esteemed than timothy for either pasture or hay. It succeeds well on poor soils. Of the numerous varieties common perennial rye grass is most generally cultivated. A form called annual rye grass—not really an annual plant, although useful for only one year—is sometimes cultivated, but is in almost every respect inferior. Italian rye grass (*Lolium multiflorum*) is much esteemed as a forage and hay grass in southern Europe, where it is native, and in the eastern United States. It is preferred by cattle to common rye grass. The young leaves are rolled up, while those of the common rye grass are folded together. It grows rapidly, forms a dense turf, and upon good soils yields several cuttings in a season. It is readily distinguished from all forms of perennial rye grass by its awned or bearded spikelets. The name "rye grass" or "wild rye" is applied to various species of *Elymus*.

RYE HOUSE PLOT. A conspiracy in 1683, among extremists of the Whig party, to waylay and assassinate King Charles II of England on his return from Newmarket, at a house called the Rye House farm, whence the plot got its

name. It was frustrated. For alleged complicity in it Lord William Russell and Algernon Sidney (qq.v.) were executed.

RY'ERSON, Adolphus Egerton (1803–82). A Canadian clergyman, journalist, and the founder of Ontario's public-school system. He was born near Vittoria, Ontario. He studied for the Methodist ministry, and after filling several pastorates he took a prominent part in founding in 1829 the *Christian Guardian*, the official organ of Canadian Methodism, and became its first editor. His interest in education led him to procure in 1836 for his denomination a charter establishing Upper Canada Academy at Cobourg, later known as Victoria University, of which he was appointed the first principal in 1841. He was appointed General Superintendent of Public Schools in Upper Canada, an office which he held for 32 years, and procured in 1846 and 1850 the passage of laws which established the basic principles of the Ontario school system, and had an enduring influence upon the school systems of the other English-speaking provinces. Although he contended for the rights of denominational colleges, he favored a central provincial university with which those colleges should be affiliated. This plan has since been almost fully realized in Ontario. A Tory Loyalist by birth and sympathy, he nevertheless opposed any narrow application of Tory principles in educational and ecclesiastical affairs. As the most prominent Canadian Methodist of his time, he perforce antagonized the Anglican attempt to control university training and to restrict public endowments for the benefit of any particular church. But when the struggle for responsible government was going on and its principles were imperfectly understood, he did not favor it because he preferred to strive for equal rights under the existing political system. Therefore he wrote a series of remarkable letters defending the Governor-General, Sir Charles (afterward Lord) Metcalfe in his contest against the reformers. He was influenced by the fear that responsible government might be introduced in an extreme form.

Ryerson's publications, all of importance, include: *Affairs of the Canadas* (1837), a series of letters in the London *Times; Report on Popular Education* (1846–47); *Letters in Defense of our School System* (1859); *The Loyalists of America and their Times* (2 vols., 1880); *The Story of My Life* (1883), an unfinished autobiography subsequently completed and published by Dr. J. G. Hodgins. Consult Nathaniel Burwash, *Egerton Ryerson*, in the "Makers of Canada Series" (Toronto, 1902).

RYE WHISKY. See Liquors.

RYEZHITSA, ryĕ'zhĭt-så. A town in the Government of Vitebsk, Russia, situated about 65 miles northeast of Dünaburg (Map: Russia, C 3). Pop., 1897, 10,681; 1910, 21,469.

RYGH, rŭg, Oluf (1833–99). A Norwegian archæologist, historian, and philologist, born at Stiklestad. Educated at Trondhjem and at Christiania University, he served the university for 40 years as director of antiquities, professor of history, and professor of Northern archæology. The pioneer in the prehistoric archæology of Norway, Rygh systematized the antiquities, made excavations throughout the country, and published many notable works, among which are *Om den ældre Jernalder i Norge* (1869; Fr. trans., 1869); *Om den yngre Jernalder i Norge* (1877); *Norske Oldsager* (1880–85), the principal work on Norwegian archæology; *Norske Gaardnavne* (Norwegian Farm Names) (1897 et seq.; 14 vols. ready in 1915), the volumes explaining the names historically and etymologically; a monumental and unique work.

RYLE, rīl, John Charles (1816–1900). An English Bishop. He was born near Macclesfield and was educated at Eton and at Christ Church, Oxford. He was appointed by Lord Beaconsfield Bishop of Liverpool (1880). Numbered among the "evangelicals" of the Church of England, his work among the poorer classes of the west of England was of an aggressive and helpful character. His works include: *The Bishop, the Pastor, and the Preacher* (1854), sketches of Latimer, Baxter, and Whitefield; *Bishops and Clergy of Other Days* (1868), lives of Hooper, Latimer, Ward, Baxter, and Gurnall; *The Christian Leaders of the Last Century* (1869); *Principles for Churchmen* (1884); *Many Points of View* (1886); *Is all Scripture Inspired?* (1898).

RYLEIEV, rī-lā'yĕf, Kondratiy Feodorovitch (1795–1826). A Russian lyric poet, who was one of the leaders of the Decembrists and died on the scaffold. His fearless attack on the all-powerful Araktcheyev (q.v.), in *The Minion* (1820), made him famous. A collection of his lyrics, *Dumy* (Meditations), and the epics, *Nalivayko's Confessions* and *Voynarovski's Dream*, assign to him a rank next to that of his friend Pushkin. With Bestuzhev he edited in 1823–25 the literary almanac, *The Polar Star*, to which Pushkin liberally contributed. His works were last edited by M. N. Mazayev (St. Petersburg, 1893). Some of his best poems have been translated into English by T. Hart Davies (2d ed., London, 1887).

RYLSK, rĭl'y'sk. A town in the Government of Kursk, Russia, situated at the confluence of the Rylo with the Seim, 84 miles west by south of Kursk (Map: Russia, D 4). It manufactures oil and trades in grain and agricultural implements. During the twelfth and thirteenth centuries it was the capital of the independent Principality of Rylsk, which was annexed to Lithuania in the beginning of the fourteenth century and to Moscow in 1500. Pop., 1897, 11,415; 1910, 13,710.

RY'MER, Thomas (1641–1713). An English critic, poet, and historian, born in Yafforth, Yorkshire, and educated at Sidney-Sussex College, Cambridge. Of his poems the best known are those in memory of Waller. Both his poetry and his criticism, which is chiefly dramatic and attacks Shakespeare for failing to preserve the unities, were highly praised by Pope and fiercely ridiculed by Macaulay. In 1692 he succeeded Shadwell as court historiographer, but in this province his only important publication was the Latin compilation of British public conventions under the title *Fœdera* (1704–35). Of this a *Syllabus* by Sir Thomas Duffus Hardy appeared in 1869 et seq. To it was prefixed a memoir which assembles virtually all the known biographical data concerning Rymer.

RYŌHITSU MATSUNAGA. See Matsunaga, Ryōhitsu.

RYSSEL, rĭs'sĕl. See Lille.

RYSWICK, rĭz'wĭk, Peace of. A treaty concluded between France and Great Britain, Spain, and Holland, Sept. 20, 1697, ending nine years of war between Louis XIV and the Grand Al-

liance. A congress of envoys from Austria, Denmark, England, Holland, the German States, Spain, and France had been in session through the summer of that year. France agreed to restore to Spain places in Catalonia and the Netherlands, and to recognize William III as King of England. Charles IV, Duke of Lorraine, was placed in possession of his States. In America and the East Indies all conquests were to be restored. Indeed, so far as territory was concerned, the general result was a return to the *status quo ante*. In a supplementary treaty signed Oct. 20, 1697, by the Emperor, considerable restitutions were made to the German States by France. The chief result of the war, as determined by the peace, was the check given to the overweening ambition of Louis XIV, whose power from this time underwent a steady decline. The village of Ryswick (Dutch *Rijswijk*) is in the outskirts of The Hague. Consult Arsène Legrelle, *Notes et documents sur la paix de Ryswick* (Lille, 1894).

RZESZÓW, zhĕ'shu̯f. A town in the Crownland of Galicia, Austria, 98 miles by rail east of Cracow (Map: Austria, H 2). Its principal buildings are the castle of Prince Lubomirski, now a prison, and the cloister of St. Bernard. Linen weaving and the manufacture of gold wares, leather, bone dust, and pipes are carried on. The town is a famous horse mart. Rzeszów was captured by the Russians, but later evacuated, in the war which began in 1914. See WAR IN EUROPE. Pop., 1900, 14,714; 1910, 26,840, mostly Poles.

RZHEV, rzhĕf. A river port in the Government of Tver, Russia, situated on the right bank of the Volga, 112 miles southwest of Tver (Map: Russia, D 3). It has a considerable flax-spinning industry and carries on a trade in grain. Pop., 1897, 21,390; 1910, 23,606.

S

S The nineteenth letter of the English alphabet. The name for its Semitic equivalent was *shin*, tooth, the letter form roughly representing a toothed edge. For the development of the letter, see ALPHABET.

In its usual phonetic sound *s* is the breathed alveolar spirant. In the formation of this sound the tongue, which is raised and approximates the upper tooth sockets, is grooved longitudinally, and the air passes through this narrow channel with a hissing sound, whence *s* is called a sibilant. The result is the *s* in *sing, mast.* The same sound is represented by *c* (before *e, i, y*), usually in words derived from French, in *cent, circle, cynic;* and by *sc* in *science, coalesce. S* has the phonetic value of *z* after a sonant at the end of a word and sometimes between vowels, as *rise, busy;* of *sh* (before consonantal *i* and rarely *u*), as *passion, mansion, sure;* of *zh* in *measure, osier, treasure.* The digraph *sh* is a sibilant in the pronunciation of which the tongue tip is turned upward rather than forward and the sound is more palatal, as in *shadow* and *shall.* This *sh* sound, found mostly in derivatives from French, is an extremely common one, whether represented by *ch,* as in *chaise, machine,* or by other combinations: *Asia, social, conscious, vitiate.*

English *s* is derived from various sources. It represents original Indo-Germanic *s* in *self,* Skt. *sva,* Lat. *se,* Goth. *sik;* Skt. *hamsa,* Gk. *χήν,* Lat. *anser,* Eng. *goose.* In words of Latin origin it also represents Indo-Germanic *d* + *t* or *t* + *t: risible,* Lat. *risus,* from **rid-tus; reverse,* Lat. *vertus,* from **vert-tus. S* represents French-Latin *s* and *ti; s* in *saint, usage; ti* in *ransom,* from Lat. *redemptionem; silence,* from Lat. *silentium.* See PHONETIC LAW.

As a mediæval Roman numeral S = 7 or 70, $\overline{S}$ = 70,000. In chemistry S stands for sulphur. As abbreviation S. stands for *south;* s. for *second* (sixtieth part of a minute), *shilling;* S.S. for steamship, Sunday school. S. stands for science in B.S., Bachelor of Science, and for society in F. R. S., Fellow of the Royal Society. Consult Henry Sweet, *Sounds of English* (Oxford, 1908); Daniel Jones, *Pronunciation of English* (New York, 1909); Maurice Prou, *Manuel de paléographie* (3d ed., Paris, 1910); Sir E. M. Thompson, *Introduction to Greek and Latin Palæography* (Oxford, 1912); W. M. Flinders Petrie, *Formation of the Alphabet* (London, 1912). See ABBREVIATIONS; LETTERS.

SAADIA (sȧ-ä′dē-ȧ) **BEN JOSEPH** (892–942). A distinguished Jewish philosopher and exegete. He was born at Diloz in the Fayum, Egypt. At an early age he made a translation of the Bible into Arabic, with notes, intended to serve as an attack upon the doctrines of the Karaites (see QARAITES), against whom he had previously written a work, *In Refutation of Anan,* and also to acquaint the Mohammedans with the contents of the Bible. Hence he used, as Ibn Ezra testifies, Arabic script, though in all of our present manuscripts the Hebrew script is used. Largely through his efforts the spread of the Karaite movement was checked. By 928 his fame had spread beyond the borders of Egypt, and he was called to be head of the rabbinical school at Sura in Babylonia. Owing to a disagreement with the Prince of the Captivity, the head of the Babylonian Jews, he lost his office and went into retirement (933), and during this period wrote in Arabic a philosophical work, *Faiths and Doctrines* (translated into Hebrew by Judah ben Tibbon). His works have been published by Derenbourg and Lambert, vols. i, iii, v, vi, and ix having already appeared. Saadia ranks next to Maimonides among Jewish philosophers, while he surpasses the latter in the thoroughness of his Biblical and Talmudical scholarship. Consult: J. Gutteman, *Die Religionsphilosophie des Saadia* (Göttingen, 1882); Winter and Wünsche, *Jüdische Litteratur,* vol. ii (Treves, 1894); S. Schechter, *Saadyana* (Cambridge, 1903); W. Bacher, "Saadia" in *The Jewish Encyclopædia* (New York, 1905).

SAALBURG. See LIMES ROMANUS. Consult *Saalburg-Jahrbuch: Bericht des Saalburgmuseums II* (well illustrated, Frankfort-on-the-Main, 1911).

SAALE, zä′le. A river of Germany. It rises in the Fichtelgebirge in Bavaria and falls into the Elbe, about 25 miles above Magdeburg, after a course of 226 miles (Map: Germany, D 3). It is navigable 103 miles by means of 17 locks. Halle is situated on its banks and it connects with Leipzig by canal.

SAALFELD, zäl′fĕlt. A town in the Duchy of Saxe-Meiningen, Germany, situated on the left bank of the Saale, 87 miles by rail southwest of Leipzig. It has a Gothic church of the thirteenth century, a castle of the seventeenth century, a Gothic town hall dating from 1537, and the ruins of the Sorbenburg, a castle believed to have been built by Charlemagne. The town manufactures machinery, paints, knit goods, etc. Pop., 1900, 11,681; 1910, 14,400. It was probably founded during the reign of Charlemagne.

SAAR, zär (Fr. *Sarre*). A river of southwest Germany. It rises in the Vosges Mountains on the boundary of Alsace and flows northwest, emptying into the Moselle a few miles above Treves (Map: Germany, B 4). It is 152 miles long, navigable 54 miles to Saarbrücken and by means of a system of locks 20 miles farther to Saargemünd. The Saar Canal connects its middle course with the Rhine-Marne Canal. The well-known Saar wines originate in this valley.

SAAR, FERDINAND VON (1833–1906). An Austrian poet and novelist, born in Vienna. He entered the army in 1849 and, retiring after the Italian campaign of 1859, devoted himself entirely to literature. In 1902 he was made a member of the House of Peers. As a lyric poet of decided individuality he made his mark with *Gedichte* (1882). Equally striking are his *Wiener Elegien* (1893). His stories, *Novellen aus Oesterreich* (2d ed., 1894), *Schicksale* (1889), *Frauenbilder* (1892), *Herbstreigen* (1897), and *Camera Obscura* (1901), depict Vienna society with rare power of analysis. His dramas were not successful. His later work comprises *Hermann und Dorothea* (1903), an idyll, and *Tragik des Lebens* (1906). He died by his own hand.

SAAR BASIN. See VOLUME XXIV.

SAARBRÜCKEN, zär'bruk-en. A town in the Rhine Province, Prussia, on the Saar, 50 miles east by north of Metz (Map: Germany, B 4). It is connected with the opposite town of Sankt Johann by two bridges, has an old castle, a town hall with frescoes by Werner, a fine new statue of Bismarck, and a Gymnasium. The town is the centre of a coal-mining district, which produces annually over 7,000,000 tons of coal. Its manufactures include woolen and linen fabrics, hardware, Berlin blue, tin and zinc wares, glass, leather, and tapestry. Saarbrücken, originally a possession of the counts of Ardennes, fell to Nassau in 1381. It was garrisoned by France from 1801 to 1815, when it came to Prussia. Saarbrücken was the scene of the opening engagement in the Franco-Prussian War of 1870–71. It was the target for a French aërial attack in the war which began in 1914. (See WAR IN EUROPE.) In 1909 the adjoining municipalities of Burbach-Malstatt and Sankt Johann were incorporated with Saarbrücken, the combined population being 105,089 in 1910.

SAARBURG, zär'bo͝orK. A town of Alsace-Lorraine, Germany, on the Saar, 44 miles by rail northwest of Strassburg (Map: Germany, B 4). It is strongly garrisoned. Gloves, lace, beer, and watch springs are manufactured. Saarburg was reached in one of the French offensive movements into Alsace-Lorraine in the war which began in 1914. See WAR IN EUROPE. Pop., 1900, 9178; 1910, 10,050.

SAARDAM, zär'dȧm. See ZAANDAM.

SAARGEMÜND, zär'ge-mu̇nt' (Fr. *Sarreguemines*). A town in the Province of Alsace-Lorraine, Germany, situated at the confluence of the Blies and the Saar, 40 miles east of Metz (Map: Germany, B 4). It has a Gymnasium and manufactures pottery, hempen fabrics, plush, silks, velvets, etc. Pop., 1905, 14,919; 1910, 15,501.

SAARLOUIS, zär'lo͞o'ē. A town in the Rhine Province, Prussia, on the Saar, near the French frontier, and 31 miles southeast of Treves (Map: Germany, B 4). Fortifications built by Vauban in 1680–85 are now used as barracks and depots. In the vicinity are lead and iron mines, and the town has manufactures of leather, wire, and firearms. Pop., 1900, 7864; 1910, 8397.

SAAVEDRA, sä'ä-vā'drȧ, ANGEL PÉREZ DE, third DUKE OF RIVAS. See RIVAS.

SAAVEDRA, ENRÍQUEZ ARIAS DE. See CUEVA, ENRÍQUEZ ARIAS DE SAAVEDRA.

SAAZ, zäts (Boh. *Žatec*). A town in the Crownland of Bohemia, Austria, on the Eger, 43 miles northwest of Prague. It is the centre of the Bohemian hop industry. The town has an institute for instruction in hop growing and preparing and gives annual prizes for excellence in this line. There are manufactures of machinery, leather, and sugar. There is a church dating from the thirteenth century. Pop., 1900, 16,168; 1910, 17,120, mostly Germans.

SABA, sä'bȧ. An island of the Dutch West Indies belonging to the Colony of Curaçao and situated among the Leeward Islands, 26 miles southwest of St. Martin Island (Map: West Indies, G 3). Area, 5 square miles. It is a circular volcanic peak rising 2817 feet above the sea. Cotton and indigo are produced. Pop., 1900, 2177; 1913, 1909.

SABA. See ASSAB.

SABAC. See SHABATZ.

SABADELL, sä'bȧ-dȧl'y'. A town of northeast Spain, in the Province of Barcelona, situated on the Barcelona-Saragossa Railroad, 11 miles northwest of the former city (Map: Spain, G 2). It is an important manufacturing centre, about half of its population being employed in its textile mills. The town has good schools. Pop., 1900, 23,375; 1910, 28,125.

SAB'ADIL'LA (Sp. *cevadilla, cedabilla,* dim. of *cevada, cebaba,* barley, from *cebar,* Lat. *cibare,* to feed, from *cibus,* food), CEBADILLA, or CEVADILLA (*Asagræa officinalis,* or *Schenocaulon officinalis*). A Mexican plant of the family Liliaceæ, whose winged wrinkled seeds have been employed in medicine like white hellebore (*Veratrum album*) since the sixteenth century and have been considered irritant, sedative, and rubefacient.

SABÆ'ANS. The name of an ancient Arabian people. Our information concerning them is derived from certain notices in the Old Testament, classical writers, cuneiform inscriptions, and especially native inscriptions, coins, and archæological remains. In Gen. x. 7 Sheba, corresponding to the Arabic Saba, is mentioned as a son of Raamah and brother of Dedan, in x. 28 as a son of Joktan and brother of Hazarmaweth. There may have been Sabæan clans in north Arabia as well as in Yemen. The story of the visit of the Queen of Sheba to Solomon, in 1 Kings x. 1–13, is regarded by many scholars as wholly legendary, as similar motives are found in the folklore of other nations, but a historic nucleus is quite possible. Tiglathpileser IV (745–728 B.C.) and Sargon II (722–705 B.C.) had relations with Samsi, a queen of the Arabs, and Esarhaddon (681–668 B.C.) with Zabibiye and Samsiye, queens of the Arabs; and the Sabæans may have had queens before the *mukarrib* period. If there were Sabæan colonies near Dedan (Al Ola), as there were Minæan colonists at Al Ola itself, a Sabæan queen may very well have sought an alliance with Solomon after he had established himself at Eziongeber (q.v.) and sent out his expeditions to Ophir (q.v.). The object of the visit

may have been of a purely political nature, to secure protection against a common enemy, the Minæans. Several passages in Isaiah, Jeremiah, Ezekiel, and Job refer to the commercial activity of the Sabæans. The fact that Sargon II received a tribute from It'amara, the Sabæan, in 715 B.C. (*Great Display Inscription*, 27) is of value for the chronology, since it shows that already, in the eighth century, a Sabæan ruler must have had interests in north Arabia which made it advisable for him to be on good terms with Assyria. He was probably one of the *mukarrib*, or priest kings, bearing the name of Yatha'amar in the native inscriptions. Fifteen of these *mukarrib* are known by name and belong approximately to the period from 750 to 525 B.C. They were followed by the kings of Saba from c.525 to 115 B.C. From c.115 B.C. to 300 A.D. the rulers called themselves kings of Saba and Raidan. Chiefly through the Egyptian commerce on the Red Sea under the first Ptolemies increased knowledge of south Arabia came to Greek writers. Eratosthenes describes the states in Yemen and the people. Strabo gives an account of the ambitious but unsuccessful Roman expedition to south Arabia under Ælius Gallus in 24 B.C. Pliny describes the Sabæans and their neighbors. From 300 to 378 A.D. Saba and Raidan were ruled by kings of Aksum. The Sabæans were then under the domination of the Himyarites (q.v.) until conquered again by the Aksumites in 525 A.D., who were driven out c.570 A.D. Before the death of Mohammed they were subjected to Moslem rule.

The Sabæans became the natural intermediaries between Egypt and India, and the chief articles of their trade were gold, precious stones, perfumes of various kinds, horses, and camels. The capital of the state was Marib in Wadi Denne; Zirwaḥ and Salḥin were fortified places in the neighborhood. The lords of minor towns and heads of prominent families seem to have stood in a sort of feudal relation to the kings. A notable feature of social life was the relatively high position occupied by women. While no queens have yet been found in the inscriptions, a woman is described in one of them as mistress of a castle, and many women are mentioned as joint authors with men of votive and dedicatory inscriptions, or as the sole authors. Many gods were worshiped by the Sabæans. Chief among them were Athtar, the morning star; Shams, the sun; Haubas, the moon; Almakah, Nakrah, Ta'lah, Raḥman, and Du Samawi, heaven. Magnificent temples were erected. The Sabæan language is dialectically different from the Minæan, Hadramautian, and Katabanian and was written in the South Semitic alphabet. The majority of the inscriptions found by Glaser, said to be over 1000, have not yet been published. For bibliography, see ALPHABET; ARABIA; MINÆANS.

SABATIER, sȧ'bȧ'tyȧ', LOUIS AUGUSTE (1839–1901). A French Protestant theologian, brother of Paul Sabatier (1858–). He was born at Vallon and was educated at Montauban and at several German universities. From 1869 to 1873 he was professor of theology at the University of Strassburg and from 1877 until his death professor in the newly founded Protestant theological faculty of the Sorbonne. After 1895 he was also dean. He became known as a representative of liberal theology. His printed works include: *Essai sur les sources de la vie de Jesus* (1866); *Mémoire sur la notion hébraique de l'esprit* (1879); *L'Apôtre Paul* (1881; 3d ed., 1896; Eng. trans., 1891); *De la vie intime des dogmes et de leur puissance d'évolution* (1890); *Esquisse d'une philosophie de la religion* (1897; Eng. trans., 1897); and the posthumous works *La doctrine de l'expiation* (1903; Eng. trans., 1904) and *Les religions d'autorité et la religion de l'esprit* (1903; Eng. trans., 1904).

SABATIER, PAUL (1854–). A French chemist, born in Carcassonne and educated at the Ecole Normale. After teaching a year at the lycée in Nîmes, he became assistant to Berthelot (q.v.) at the Collège de France. He was instructor in physics at Bordeaux in 1880–81 and in 1882 was called to the University of Toulouse, where he accepted the chair of chemistry in 1883. He declined an appointment as successor to Moissan (q.v.) at the Sorbonne. He won the Lacaze prize (1897) and the Jecker prize (1905) of the French Academy of Sciences and in 1912 divided the Nobel prize for chemistry with V. Grignard of Nancy. In 1915 he received the Davy medal of the Royal Society of Great Britain for his researches on contact action and on the application of finely divided metals as catalytic agents. His most famous work is *La catalyse en chimie organique* (1913; Ger. trans., 1914).

SABATIER, sȧ'bȧ'tyȧ', PAUL (1858–). A French Protestant theologian and historian, born at Saint-Michel-de-Chabrillanoux (Ardèche), brother of Louis Auguste Sabatier. He studied in the theological faculty of the University of Paris, became vicar of the French parish of Saint-Nicolas at Strassburg, and afterward pastor of Saint-Cierge-la-Serre. His health compelling him to withdraw from active ministerial duties, he settled in Assisi, Italy, and founded there the Société Internationale des Etudes Franciscaines. His publications include learned editions of *La Didaché, ou l'enseignement des douze apôtres* (1885), with the Greek text and a commentary; *Speculum Perfectionis seu Francisci Assisiensis Legenda Antiquissima, Auctore Fratre Leone* (1898); Bartholus' *Tractatus de Indulgentia* (1900); the *Regula Antiqua Tertii Ordinis* of Franciscus (1901); *Actus Sancti Francisci* (1902). Sabatier wrote: *La vie de Saint François d'Assise* (1892; Eng. trans., 1894), based on previously unused documentary sources discovered by him in various local Italian archives; *A propos de la séparation des églises et de l'état* (1905; Eng. trans., 1906); *Lettre ouverte au cardinal Gibbons . . . sur la séparation des églises et de l'état en France* (1907); *Modernism* (1908), Jowett Lectures; *Les modernistes* (1909); *L'Orientation réligieuse de la France actuelle* (1911).

SABA'ZIUS (Lat., from Gk. Σαβάζιος). A Thracian-Phrygian nature god. He originally typified the powers of nature in their vivifying aspect and the yearly renewal of life. His worship was closely associated with that of Cybele (q.v.) and Attis (q.v.) and was orgiastic in character, later degenerating into sexual excesses. Sabazius was represented as horned and had for his symbol a snake, which typified by the shedding of its skin the renewal of nature. (See NATURE WORSHIP, *Theriolatry.*) His worship was introduced into Athens as early as the fifth century B.C. At Rome, together with other Oriental cults, it became widespread during the

decadence of paganism, especially in the second century A.D. In Greco-Roman mythology Sabazius was identified with Dionysus or with Zeus. He was further regarded as the son of Zeus and Persephone and was said to have been destroyed by the Titans. Consult François Lenormant, *Sabazius* (Paris, 1875); Otto Gruppe, *Griechische Mythologie und Religionsgeschichte* (2 vols., Munich, 1906); Georg Wissowa, *Religion und Kultus der Römer* (2d ed., ib., 1912).

SAB'BATH (Heb. *shabbath*, Bab. *shabattum*, from the root *shabath*, to complete, finish, cease). The designation given to the 15th day of the month by the Babylonians and apparently also by the Hebrews in earlier times, to the 7th day of the week by the Jews, and sometimes to the 1st day of the week by the Christians. A cuneiform inscription published by Pinches (*Proceedings of the Society of Biblical Archæology*, London, 1904) reveals the fact that the 15th of the month was called *shabattum*. The etymology and the date render it obvious that the term indicates the day of the full moon. Another inscription (*II Rawlinson*, 32, 1, 16) explains *shabattum* as *um nuh libbi* (day of rest for the heart). This probably means that it is a day allaying the fears aroused by the transition from the crescent to the gibbous moon. Religious ceremonies are connected with all such transition periods in the life of nature and of man, as has been shown with many illustrations by Van Gennep (*Rites de passage*, Paris, 1909). How the Babylonian Sabbath was celebrated we do not know. But some light is shed by an inscription (*IV Rawlinson*, 2d ed., 32, 33) in which the King is warned against eating food cooked over a fire, riding in a chariot, and putting on festive garments on the 7th, 14th, 19th, 21st, and 28th days of the month. Four of these are manifestly connected with the lunar changes.

It is held by a number of scholars that there are traces in the Old Testament of a similar connection between the Sabbath and the full moon in Lev. xxiii. 15. The Passover festival, which falls on the 15th of Nisan, is called Sabbath. The Feast of Tabernacles and the Purim festival, though not distinctly called Sabbaths, also fall on the 15th. The new moon and the Sabbath are frequently associated with each other. Concerning the manner in which the Sabbath on the 15th gave place to a weekly Sabbath only surmises are possible. It is highly probable that from time immemorial special distinction was given in Syria to the 7th, 14th, 21st, and 28th days after the new moon, marking the lunar phases, as well as to the neomenia and the celebration of the full moon on the 15th, and that the custom was enhanced through the long-continued and profound cultural influence of Babylonia. When the Hebrew tribes invaded Syria in the fifteenth century B.C. (see Jews), they would naturally adopt this custom, if they did not already possess it. There are indications that the term Sabbath may have been extended from the day of the full moon to the first phase of the gibbous moon, then to each lunar phase, and to every seven-day period, and finally to the 7th day. With the name some of the nature of the original Sabbath passed to the 7th day. Jastrow has called attention to this double nature of the later Hebrew Sabbath. It possesses some features of the inauspicious day, reminding of the restrictions in the case of the Babylonian *umu limnu* (evil day) and at bottom incompatible with its character as a day of rest. Various motives may have led to the substitution of every 7th day for the days marking the phases of the moon, such as the sacredness of the number seven, the inconvenience of having one period (from the 28th to the 7th) longer than the other, and the desire to dissociate the day and the name from the celestial luminary men were always tempted to worship (Job xxxi. 27). As the original lunar character of the Passover, the Feast of Booths, and the Purim, on the 15th of the month, could be obscured by associating with them glorious memories of Israel's past, so the original nature of the day marking the full moon, or the quarters of the moon, could be forgotten, if it were made a memorial of the cessation of Egyptian bondage, or the completion of creation. In Deut. v. 15 the freedom from slavery in Egypt is given as a reason for keeping the Sabbath, in Ex. xx. 11 God's rest after creating the world. The difference has suggested to many scholars that both may be later additions, and that the original form of the Fourth Commandment is likely to have been "Remember the day of the Sabbath to keep it holy." This form leaves it uncertain whether the 15th of the month, as in Lev. xxiii. 15, or every 7th day is intended. (See Decalogue.) We have no means of determining when the 7th-day Sabbath was first introduced, but it is probable that it existed before the Babylonian exile. In the Chaldæan and Persian periods the observance of the Sabbath was more and more emphasized (Isa. lvi. 2 ff.; Jer. xvii. 22 ff.; Ezek. xx. 16 ff.; Neh. xiii. 15 ff.). In the days of the Maccabæan uprising there was a prohibition against bearing arms on the Sabbath (1 Macc. ii. 20 ff.). The Book of Jubilees (see Apocrypha) lays down rules (ii, 17 ff.; l, 6 ff.) that go beyond the restrictions in the Old Testament. Thus, preparation of food, riding on a beast, drawing water, carrying a burden, going on a journey, cohabiting, striking a thing, and fighting were prohibited on the Sabbath on penalty of death. The Scriptures were read in the synagogue and expounded on the Sabbath (Philo, *De specialibus legibus*, II. 56 ff.; Luke iv. 16, 44). While Mishna and Gemara emphasize and explain in detail the duties connected with Sabbath observance, they also contain many instances of abrogation or modification of earlier prescriptions, as in the case of danger to life of man and beast, circumcision, certain priestly labors, and the Sabbath-day's journey. The statement "The Sabbath is given into your hands, but you are not given into its hand" (Yoma, 85 b; Mekilta to Ex. xxxi. 13, 14) reminds of the radical utterance of Jesus: "The Sabbath was made for the sake of man, and man was not made for the sake of Sabbath; therefore man is also lord of the Sabbath" (Mark ii. 38). The strictness of the Sabbath observance continued through the Middle Ages and in orthodox circles until the present day. There can be no doubt that the 39 prohibitions on the Sabbath were felt in some circles as a burden, or there would have been no efforts to make the requirements easier. But it is a great exaggeration to cite the casuistry of Sabbath legislation as the chief evidence of the intolerable condition of life under the law. It must be borne in mind that the day of rest from labor has proved to be a boon to the hard-working Jew in all ages and to all nations

that through Jewish influence have adopted it, and that the very restrictions surrounding it have given it a nobler character as a family festival without affecting seriously its quiet joy and happiness.

In spite of Paul's contention that the observance of days was bondage to beggarly elements (Gal. iv. 9 ff.), various Christian sects have continued to keep the Sabbath to this day. The Church itself has transferred to the 1st day of the week many features of the Jewish Sabbath, applied the Commandment in the Decalogue concerning the 7th day to the 1st, and designated the latter as Sabbath. See SUNDAY.

Bibliography. Wilhelm Lotz, *Quæstiones de historia sabbati* (Leipzig, 1883); Israel Abrahams, *Jewish Life in the Middle Ages* (London, 1896); R. J. Floody, *Scientific Basis of Sabbath and Sunday* (2d ed., Boston, 1906); I. Benzinger, *Hebräische Archäologie* (2d ed., Tübingen, 1907); Hugo Gressmann, "Feste und Feiern Israels," and Fiebig and Zscharnack, "Sabbath" and "Sabbatharier," in *Die Religion in Geschichte und Gegenwart*, edited by Gunkel and Scheel, vols. ii, v (Tübingen, 1910, 1913); Morris Jastrow, *Hebrew and Babylonian Traditions* (New York, 1914).

SABBATICAL YEAR. An institution of the Pentateuchal codes, according to which primarily the fields were to lie fallow every seven years; afterward the provisions were extended to include relief from various obligations incurred by members of the community. The sabbatical year is referred to in the Book of the Covenant (Ex. xx. 23–xxiii. 33), the Deuteronomic Code, and the Holiness Code (Lev. xvii–xxvi). In the first and third, special stress is laid upon the provision requiring the land to lie fallow (Ex. xxiii. 10–11; Lev. xxv. 3–7); in the Deuteronomic Code no reference to such an ordinance occurs. Again, the first two codes agree in providing for the remission of slaves after six years' service (Ex. xxi. 2–6; Deut. xv. 12–18); the Holiness Code seems to provide for such emancipation only in the fiftieth or jubilee year (Lev. xxv. 39–55). Lastly, the Holiness Code (Lev. xxv. 8–10, 12–16, 23–34) is unique in providing under certain conditions for the "release" in the jubilee year (i.e., the seventh sabbatical year) of patrimonial estates which have been sold, to the end that such estates should not be permanently alienated. Deuteronomy (xv. 1–3) has a special ordinance for the remission or suspension of debt every seven years.

These divergences seem to indicate a gradual evolution of the institution, beginning with the custom, common in agricultural communities, of letting the land lie fallow at periodical intervals. The remission of Hebrew slaves after six years of service apparently became a dead letter, and accordingly the term of service was extended, and a general emancipation appointed every 50 years, no matter how long (or short) a period of service had preceded. The remission of debt probably also lapsed, and stipulations were inserted for the reversion of property to the original owners in the jubilee year. Hence it is very probable that the only feature of the sabbatical year which was carried out in practice was the ordinance requiring that the land should lie fallow every seven years. Consult I. Benzinger, *Hebräische Archäologie* (2d ed., Tübingen, 1907). See JUBILEE.

SABBATION, sȧb-bā'tē-ŏn. See SAMBATION.

SABEL'LIANISM. See MONARCHIANS; SABELLIUS.

SABEL'LIUS. A celebrated heretic of the third century who taught that God manifests Himself in three modes, or forms, without recognizing any personal distinctions in the Godhead. (See NICENE CREED; TRINITY.) Our information respecting the events of Sabellius' life is very scanty, only a few fragments of his works having survived and the existing accounts being written by his theological opponents. Born perhaps in the Libyan Pentapolis, early in the third century he went to Rome, where he adopted Monarchian views, especially those of a modalistic type. (See MONARCHIANS.) Here he was excommunicated by Pope Callistus (or Calixtus). Leaving Rome, Sabellius went to Ptolemais, where he was made presbyter. Consult: Samuel Cheetham, *History of the Christian Church during the First Six Centuries* (New York, 1894); G. P. Fisher, *History of Christian Doctrine* (ib., 1896); Adolf Harnack, *History of Dogma*, vol. iii, English translation by Neil Buchanan (Boston, 1897); Robert Rainy, *The Ancient Catholic Church* (New York, 1902); also the works of Hippolytus, Athanasius, and Epiphanius.

SA'BIANS. A name given by Mohammed and early Moslem writers to a people classed with those possessing a written revelation, distinguished from idolaters and accorded an exceptional position, probably the Mandæans (q.v.). From the ninth to the twelfth century it was falsely applied to themselves by the pagans of Harran for the purpose of escaping persecution, and in later times it was used indiscriminately of both Mandæans and pagans of Harran, or explained as apostates from the true faith or worshipers of the host of heaven. There are three passages in the Koran in which Mohammed refers to the Sabians. A number of passages from Buchari, Ibn Hisham, and Aghani have been collected, which show that Mohammed himself and his followers were designated as Sabians by their pagan contemporaries. The reason for this designation must have been some practice or belief that to the popular mind identified Mohammed and his followers with the Sabians. As the name Sabians undoubtedly is derived from *saba'*, to immerse, there can be no question but that a sect practicing baptism is meant. The relations of the Elkesaites (q.v.), Hemerobaptists, Mughtasila, and Mandæans have not yet been fully cleared up in spite of the careful researches of Brandt. But the emphasis put upon their sacred books renders it perhaps probable that some branch of the Mandæans is intended. (See MANDÆANS.) It was the institution of ablutions before the daily prayers that seemed so peculiar to the pagan Arabs and led them to describe the Moslems as Sabians.

According to the testimony of a Christian writer, Abu Yusuf Absha'a al Qathi'i, who lived at the end of the ninth century, some of the pagans in Harran who were neither willing to become Christians nor to adopt Islam gained for themselves toleration by following the advice of a Moslem lawyer to call themselves Sabians. This was in the year 830. A Sabian cult community was formed in Bagdad, and among its members were men of great learning and influence. The greatest of all these so-called Sabians were Thabit ben Qorrah (died 901), who wrote 150 works in Arabic and 16 in

Syriac, and Abu Ishak Ibrahim, poet, scientist, and historian. But among their descendants were many eminent men, to whose enthusiastic study of Greek antiquity and liberal views on theology their Mohammedan contemporaries were greatly indebted. Through Shahrastani, Maimonides, and others their religious and philosophical views became known to European scholars.

It is the merit of Chwolson to have presented all the important literary material bearing on the question and to have drawn the conclusions now generally accepted as to the use of the term in Arabic literature, thereby putting an end to the baseless speculations about Sabism. Consult: Daniel Chwolson, *Die Ssabier und der Ssabismus* (2 vols., St. Petersburg, 1856); Julius Wellhausen, *Reste arabischen Heidentums* (2d ed., Berlin, 1897); Wilhelm Brandt, *Die jüdischen Baptismen* (Giessen, 1910).

SA'BIN, ALVAH HORTON (1851–). An American chemist, born at Norfolk, N. Y. He studied at Bowdoin College (S.B., 1876; S.M., 1879), was professor of chemistry at Ripon College in 1876–80 and at the University of Vermont in 1880–86, serving also as State chemist of Vermont in 1882–86. From 1888 to 1905 he was engaged professionally in the manufacture of varnish in New York City, but in 1910 became consulting chemist to the National Lead Company. He lectured at New York University after 1897 and served as an assistant editor of *Chemical Abstracts* (American Chemical Society) after 1907. In 1883 he invented the modern process of making sugar of milk. He published: *The Industrial and Artistic Technology of Paint and Varnish* (1904); *House Painting, Glazing, Paper Hanging, and Whitewashing* (1908); *German and American Varnish Making* (1911).

SABIN, JOSEPH (1821–81). An American bibliographer, born at Braunston, England. After serving as apprentice to an Oxford bookseller, he set up an independent shop and published in 1844 *The XXXIX Articles of the Church of England, with Scriptural Proofs and References.* In 1848 he removed to the United States, where he conducted shops for the sale of old and rare books and prints, from 1850 to 1856 in New York, from 1856 to 1860 in Philadelphia, and again in New York from 1860. In 1868 he undertook the publication of *A Dictionary of Books Relating to America, from its Discovery to the Present Time,* continued by others as *Bibliotheca Americana* (20 vols., 1868–92); and prepared *A Bibliography of Bibliography; or, A Handy Book about Books which Relate to Books* (1877). He also published two series of reprints concerning American history, one of tracts in seven volumes (1865) and one of more extended works in five volumes (also 1865).

SABINA, POPPÆA. See POPPÆA SABINA.

SABINE, sȧ-bēn'. A town and port of entry in Jefferson Co., Tex., 60 miles by water and 105 miles by rail east of Galveston, on the Texas and New Orleans Railroad (Map: Texas, F 5). It is situated on Sabine Pass harbor, on which the government has expended $4,500,000 in dredging and jetty building, thus enabling vessels to pass into the Gulf of Mexico. Sabine carries on an extensive trade in lumber, sulphur, fish, and oil, the commerce of the port in 1915 being valued at $30,097,548, of which $29,274,786 was exports. There are here four immense oil wharves and large sulphur and fish-packing plants. Pop., 1900, 900; 1910, 662.

SABINE, sāb'in. A shrub. See SAVIN.

SABINE, SIR EDWARD (1788–1883). A British physicist and soldier. He was born in Dublin, received a military education, and saw active service in the Royal Artillery in the war with the United States in 1812. He accompanied Sir John Ross (q.v.) and Sir William Parry (q.v.) in their expedition (1818–20) to the north coast of America (see ARCTIC REGION; POLAR RESEARCH), making a series of astronomical and magnetic observations of great value. He later (1821–23) undertook a series of voyages, visiting many places between the equator and the North Pole and making at each point observations the results of which were published, with other information, in 1825. His many experiments dealt with almost every phase of terrestrial magnetism. Sabine extended magnetic science especially by causing the establishment of magnetic observatories in different parts of the world and by the collation of the enormous mass of facts thus acquired. In 1818 Sabine was elected a fellow of the Royal Society, in 1856 he was raised to the rank of major general, and in 1869 he was created Knight Commander of the Bath. He was the author of a work *On the Cosmical Features of Terrestrial Magnetism* (1862).

SABINE, WALLACE CLEMENT (1868–1919). An American physicist and mathematician. He was born at Richwood, Ohio, graduated from the State university in 1886, and studied at Harvard (A.M., 1888), where he was assistant (1889–90), instructor (1890–95), assistant professor (1895–1905), and professor (1905–14) of physics, dean of the Lawrence Scientific School (1906–09) and of the Graduate School of Applied Science after 1908, and Hollis professor of mathematics after 1914. Sabine is author of *Architectural Acoustics* (1900).

SABINE (sȧ-bēn') **RIVER.** A river which rises in northeastern Texas and flows southeast to the Louisiana boundary, then southward, forming the boundary between Texas and Louisiana, until it empties through Sabine Lake and Sabine Pass into the Gulf of Mexico (Map: Texas, F 4). It is about 500 miles long, but navigable only for a short distance and for small vessels. The navigation of the pass has been improved by dredging and jetty building and accommodates vessels of 24 feet draft. The Sabine is an historic stream and was involved in the sharp boundary controversy between Spain and the United States.

SABINES, sā'bīnz (Lat. *Sabīnī*). An ancient people of central Italy, of Umbro-Sabellian stock, northeast of Rome. Their land extended from the sources of the Nar, on the borders of Picenum, as far south as the Anio. The Umbrians were on the north, the Umbrians and Etruscans on the west, the Latins and Æqui on the south, and the Marsi and Picentini on the east. The entire length of the Sabine territory did not exceed 85 miles, from the lofty and rugged group of the Apennines, anciently known as the Mons Fiscellus (now Monte della Sibilla), to Fidenæ on the Tiber, 5 miles from Rome. None of their towns was of any size or political importance. The Sabines were a brave, stern, religious race, with virtues of an austere and homely character. Their part in the formation of Rome is mentioned under ROME, *Ancient Rome* (first paragraph), *His-*

tory of Rome during the Earliest or Regal Period (first paragraph), and ROMULUS. Their whole territory fell under Roman sway after the victory of M. Curius Dentatus in 290 B.C., and in 268 B.C. its inhabitants received the full Roman franchise, while about 240 B.C. they were enrolled in the newly formed *tribus Quirina*. The Sabines were the parent stock of the Samnites (q.v.). Consult R. S. Conway, *The Italic Dialects* (Cambridge, 1897); and see ITALIC LANGUAGES.

SABIN'IANS. A school or sect of Roman jurists during the first and second centuries of the Christian era. Its origin was ascribed to Capito, head of one of the law schools at Rome in the time of Augustus, as the origin of the rival Proculian sect was ascribed to Labeo, a distinguished contemporary teacher and writer. Each school, however, took its name from a pupil and successor of its founder—the Sabinian school from Masurius Sabinus, second head of the school and author of a standard commentary on the civil law. His successor was Cassius Longinus, who flourished in the reign of Nero and enjoyed so high a reputation that the later adherents of the sect sometimes termed themselves Cassians. Other distinguished members of the school were Salvius Julianus, Pomponius, Africanus, and Gaius. Gaius was the last jurist who regarded himself as an adherent of either of the two schools, and in not a few cases he accepts, in his *Institutes*, the doctrines of the Proculians. See CIVIL LAW; PROCULIANS; and for literature, consult Muirhead, *Historical Introduction to the Private Law of Rome* (2d ed., Edinburgh, 1899).

SABLE (OF., Fr. *sable*, black, from Russ. *soboli*, Lith. *sabalas*, sable, perhaps from Turk. *samūr*, from Ar. *sammūr*, marten). A fur-bearing animal, noted for yielding the most valuable pelt of all of the Mustelidæ, of which two species exist, one in northern Russia and Siberia (*Mustela zibellina*) and one in Canada (*Mustela americana*); but the latter is usually known as the pine marten. The Siberian sable, exclusive of the tail, is about 18 inches long. The fur is dark brown (not black), grayish yellow on the throat, and small grayish-yellow spots are scattered on the sides of the neck. The whole fur is extremely lustrous and hence of the very highest value, an ordinary sable skin being worth $30 or $35 and one of the finest quality $200. The fur attains its highest perfection in early winter, and the pursuit of the sable at that season is one of the most difficult and adventurous of enterprises. It is taken by traps, which are of a kind to avoid injury to the fur, and it is not easily captured. Its general habits are those of the marten (q.v.). See Plate of FUR-BEARING ANIMALS.

SABLE. The name for black in heraldry (q.v.), represented in engraving by crossing perpendicular with horizontal lines.

SABLE, CAPE. See CAPE SABLE.

SABLE ANTELOPE. A large antelope of South Africa (*Hippotragus*, or *Egocerus, niger*), remarkable for its glossy black coat, sharply set off by the white of the under parts, buttocks, and parts of the face. It carries its head high, its neck is adorned with a heavy mane, and it has long, curving, and heavily ringed horns, which it uses with terrible effect when attacked by packs of the Cape hunting dogs or by hunters' hounds. It has been known to impale and kill leopards and even lions. It formerly ranged over all the high plains in small herds which had great speed and endurance, and its beauty and the sport it afforded have been enthusiastically commented upon by every South African hunter, but it is now scarce. Consult *The Book of the Antelopes* (London, 1894–1900), and Edmund Heller, *New Sable Antelope from British East Africa*, published by Smithsonian Institution (Washington, 1910).

SABLE ISLAND. A low-lying crescent-shaped island in the Atlantic Ocean, 104 miles southeast of Cape Canso (Map: Nova Scotia, K 9). Formed of sand hills thrown up by the sea, it is about 20 miles long by 1 mile wide. The sand hills surround a shallow lagoon 11 miles long, and nowhere exceed 80 feet in height. From either extremity sand bars extend for about 20 miles and are a constant menace to ships. There is no harbor on the coast. The island lies in the track of navigation between America and Britain. Up to 1915 more than 200 ships are known to have been wrecked here. A life-saving establishment is stationed here. In 1901 the Canadian government completed arrangements for checking the shifting of the sands and making the island a more conspicuous feature by planting trees. The action of the sea constantly washes away the shore.

SABLES D'OLONNE, sȧ'bl' dŏ'lŏn', LES. The capital of an arrondissement and a seaport in the Department of Vendée, France, 23 miles south of La Roche-sur-Yon by rail (Map: France, N., D 6). Oyster and sardine fishing and canning and shipbuilding are carried on. There is a lighthouse. The fine beach, with a wide promenade, road, elegant villas, the municipal casino, the aquarium, etc., attract summer visitors. Pop., 1901, 12,244; 1911, 14,005.

SABOT, sȧ'bō' (Fr., wooden shoe). A kind of wooden shoe very often used by the French and Belgian peasantry. The fabrication of sabots forms an important branch of French industry, carried on chiefly in the departments of Aisne, Aube, Maine-et-Loire, and Vosges. See SHOES AND SHOE MANUFACTURE.

SABOTAGE, sȧ'bō'tȧzh'. Willful obstruction of or interference with the processes of industry on the part of employees with the object of reducing the profit or impairing the capital of an employer and thus compelling him to accede to demands of the employees. The practice of sabotage is coeval with industrialism. It was first defined and given a recognized place among the weapons of organized labor in the congress of the General Confederation of Labor of France in 1887. Since that time sabotage has been accepted by the syndicalists of France and other Latin countries and by revolutionary labor unions in other countries, such as the I. W. W. in the United States, as an instrument of industrial warfare not less effective than the strike.

The manifestations of sabotage are extremely varied. Disabling machinery through placing sand in the bearings, unscrewing nuts, destroying belting, is a common form. Tying up of an enterprise, such as a railway system, through excessively punctilious observance of rules, is a much approved form. Misplacing of tools, waste of material, the insertion of defective material with a view to ruining the employer's good will, the betrayal of trade secrets, especially the exposure of conditions in production that will deter customers from buying, are part of the normal technique of sabotage. Anything like

the complete destruction of machinery, the wrecking of trains, or the placing of human life in danger, is discountenanced by the apostles of sabotage. It is held desirable that the machinery of production should remain practically intact for the resumption of work after sabotage has achieved its end in securing concessions. It is also held desirable that the practice of sabotage be conducted so carefully as to avoid contact with the criminal law and, where possible, to escape detection by the employer. See INDUSTRIAL WORKERS OF THE WORLD.

SABRE. See SWORD.

SABRE-TOOTHED TIGER. The Machærodontidæ, or sabre-toothed cats, comprise a group of fossil catlike mammals, characterized chiefly by enlargement of the upper canine teeth. By some writers they are regarded as constituting a distinct family, while others rank the group as a subfamily of the Felidæ. The term "sabre-toothed tiger" designates particularly *Smilodon* (or *Machærodus*) *neogæus*, a fossil cat from the Pleistocene deposits of South America, of which complete skeletons have been found exceeding the lion in size. It is chiefly remarkable by reason of the enormous development of the upper canines, which are 7 inches long and flattened, with finely serrated cutting edges. In compensation for the enlargement of these teeth the lower canines are so reduced as to resemble the incisors. The brain is proportionally smaller than in the modern large cats. In England the sabre-toothed tigers are known to have been contemporaneous with the cave man. The group attained its highest specialization and finally became extinct in the Pleistocene period. A nearly allied form (*Nimravus*) occurs in the Middle Miocene of Oregon.

SABRI'NA. Daughter of Locrine, the son of King Brute of ancient Britain and Estrildis, thrown into the river Severn by Queen Guendolen and metamorphosed by Nereus into the goddess of the river. She is described as a nymph in Drayton's *Polyolbion*, in Milton's *Comus*, and in Fletcher's *Faithful Shepherdess*.

SACAGAWEA, sȧ-kạ'gȧ-wē'ȧ, or **SACAJAWEA,** sȧ-kạ'jȧ-wē'ȧ (c.1788–?). An American Shoshone Indian guide, born near the sources of the Missouri River. She was captured as a child by the Minetaree and sold as a slave to a Frenchman in the Dakotas. When Lewis and Clark passed through that region in 1804 they engaged Sacajawea and her husband as guides. With her newborn babe on her back the Indian woman led the expedition through the wilderness and sometimes through the territory of hostile tribes. Her ability to procure food from the Indians, some of whom were her own people, was the salvation of the expedition. On one occasion she saved the journals of Lewis and Clark at the risk of her own life. She accompanied the expedition back in 1806, and the last heard of her was in 1811. A bronze statue of the guide, by Alice Cooper, was erected at Portland, Oreg., in 1905. For bibliography, see LEWIS AND CLARK EXPEDITION.

SAC (săk *or* sạk) **AND FOX INDIANS.** See FOX or MUSKWAKI; SAUK.

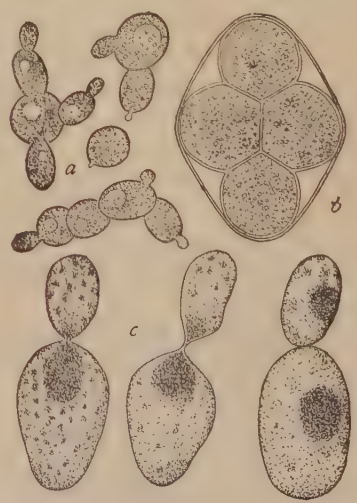
SACCARDO, sȧk-kär'dō, PIER ANDREA (1855–1920). An Italian botanist, born at Treviso and educated at the Liceo of Venice and in the University of Padua, where he became professor of botany in 1879 after 10 years as teacher of natural history in the school of technology of the same city. Save for his *Sommario di un corso di botanica* (1871; 4th ed., 1898), his work is almost entirely on mycology. Following such special treatises as *Musci Tarvisini* (1872) and *Fungi Italici* (1877–86, with 1500 colored plates), came his great universal work, *Sylloge Fungorum Omnium*, in 18 volumes (1882–1906). Later works are *Chromotaxia* (1890; 2d ed., 1894) and *La botanica in Italia* (1895–1901).

SAC'CAS, AMMONIUS. See AMMONIUS.

SAC'CHARIM'ETRY. See POLARISCOPE.

SACCHARIN, săk'kȧ-rĭn (from ML. *saccharum*, Lat. *saccharon*, from Gk. *σάκχαρον*, *sakcharon*, sugar, from Pers. *sakar*, from Prak. *sakkara*, sugar, Skt. *śákarā*, candied sugar, grit), orthobenzosulphimide, $C_6H_4\begin{matrix}CO\\SO_2\end{matrix}NH$. An intensely sweet substance discovered by Remsen and Fahlberg in 1879. The substance was patented in the United States and in European countries and is manufactured on a large scale in Germany from toluol, $C_6H_5CH_3$, a hydrocarbon obtained from coal tar. It forms a white powder, only slightly soluble in water, but readily soluble in alkaline liquids. It melts at 220° C. (428° F.). Recent experiments show that the pure substance possesses about 500 times the sweetening power of cane sugar. The commercial product, however, often contains as much as 50 per cent of impurities and its sweetening power is only about 300 times as great as that of cane sugar. Saccharin is usually sold in tablets of one grain each, mixed with a little bicarbonate of soda to increase solubility. These may be dissolved in water, in milk, or in coffee. Saccharin is largely used in the manufacture of cordials and mineral waters, in baking, preserving fruit, etc. It is used as a substitute for sugar in the diet in diabetes, but for normal individuals such substitution is highly undesirable and in some countries the free use of saccharin has been prohibited by statute.

SACCHAROMYCETES, săk'kȧ-rō-mī-sē'tēz (Neo-Lat. nom. pl., from ML. *saccharum*, sugar



YEAST.

a, reproduction by budding; *b*, formation of spores; *c*, nuclear division in budding.

+ Gk. *μύκης*, *mykēs*, mushroom). One of the great groups of fungi (q.v.) and containing the yeasts. (See FERMENTATION.) Yeasts are one-

celled plants with a peculiar method of growth termed budding, in which the cell puts out one or more processes which finally become pinched off from the mother cell. The buds may remain attached for a long time, so that they form an irregular group of cells clinging together. Many yeasts form spores, the protoplasm separating into two or four masses that become walled and lie inside the mother cell. *Saccharomyces cerevisiæ*, the beer yeast, has been cultivated for centuries and is not known in the wild state. The origin of such yeasts is not certain, but all evidence points to their derivation from some of the higher fungi. The yeast of wine fermentation is said to originate from spores of the filamentous mildew-like fungus (*Dematium*) that grows on the surface of grapes. The identification of yeasts is a matter of practical importance to those who use the organisms in brewing, because certain wild yeasts seriously injure or spoil the work of the beer yeast.

SACCHETTI, sȧkkĕt′tē, Franco (c.1330–c.99). An Italian novelist and poet, born in Florence. His most important work is a collection of several hundred *Novelle*, of the manner of Boccaccio, much of whose humor Sacchetti possesses. His character Basso della Penna is a proverbial type of the practical joker, as his Gonnella is of the buffoon. Among Sacchetti's poems his burlesque *La battaglia delle belle donne colle vecchie* is perhaps most typical, though he cultivated successfully the ballad, the *caccia*, and other forms of folk poetry. Consult: the edition of Gigli (Florence, 1860); translations by Roscoe, *Italian Novelists* (1825); the edition of ballads by Franchi (Lucca, 1853); various articles in Carducci's *Studi letterari* (2d ed., Leghorn, 1880).

SACCHINI, sȧk-kē′nē, Antonio Maria Gaspard (1734–86). An Italian operatic composer of the Neapolitan school, born in the environs of Naples. His first marked success was the opera *Semiramide*, produced at Rome in 1762. In consequence of the success in Venice of *Alessandro nell' Indie* (1766), he became director of the Conservatory del Ospedaletto in that city. In 1771 he went to London, where he spent the next 10 years, scoring several successes. He then went to Paris, where he wrote two new works, *Dardanus* (1784) and his most famous production, *Œdipe à Colone* (1786).

SAC FUNGI. See Ascomycetes.

SACH′ALINE, or Giant Knotweed (*Polygonum sachalinense*). A hardy perennial herb, 6 to 12 feet high, with strong, extensively spreading rootstocks, broad, nearly heart-shaped leaves often a foot in length, and small flowers, which appear late in autumn. The plant is a native of eastern Siberia, from whence it was brought to Europe and grown in many botanic gardens. It came prominently into notice about 1893, when the drought in western Europe caused a decided shortage in forage for cattle. This plant was little affected, and since its tender shoots and leaves were eaten by stock, the plant was widely grown experimentally as a forage crop. It has proved less useful than was predicted, and its cultivation in the United States has been almost entirely abandoned. False sachaline (*Polygonum cuspidatum*) has smaller and more pointed leaves.

SACHAU, zä′gou, Karl Eduard (1845–). A German Orientalist, born in Neumünster and educated at Kiel and Leipzig. In 1872 he became professor of Semitic languages in Vienna. After 1876 he held a similar chair at Berlin, where from 1887 he was also director of the new Seminar für orientalische Sprache. Sachau traveled much in the East and published, among many other volumes, an English translation of Alberuni's *Chronology of Ancient Nations* (1879; Arabic text, 1876–78) and of the same writer's *India* (1888; Arabic text, 1887); *Reise in Syrien und Mesopotamien* (1883); *Arabische Volkslieder aus Mesopotamien* (1889); *Ueber die Poesie in der Volkssprache der Nestorianer* (1896); *Mohammedanisches Recht* (1897); *Am Euphrat und Tigris* (1900); *Studien zur ältesten Geschichts-Ueberlieferung der Araber* (1904); *Aramäische Papyrus und Ostraka aus einer jüdischen Militärkolonie zu Elephantine* (1911); and several valuable catalogues of Persian, Syriac, and Arabic manuscripts.

SACHER-MASOCH, sä′ẽr-mä′zŏg, Leopold von (1835–95). An Austrian novelist. He studied at Graz and Prague, taught history at Graz, and published (1857) *Der Aufstand in Gent unter Karl V.* His first novel, *Eine galizische Geschichte*, appeared in 1866. His fiction, devoted in part to Galician life, is somewhat unsavory, sensational, but of rich imagination. It gave rise to the word Masochism as a form of abnormal sexual psychology. Best known of his many novels is *Das Vermächtnis Kains* (1870).

SACHEVERELL, sȧ-shĕv′ẽr-ẽl, Henry (c.1674–1724). An English high churchman, born at Marlborough and educated at Magdalen College, Oxford. His prominence was gained by two sermons preached in 1709, one at Derby, the other at St. Paul's, in which he attacked the principles of the Act of Settlement, asserted the doctrine of nonresistance, and decried the Act of Toleration. The House of Commons impeached him for these utterances and the Lords found him guilty. But popular opinion rose so strong in the preacher's favor that the authorities dared go no further than to suspend him from preaching for three years and to order the obnoxious sermons to be publicly burned. At the general election, which came on almost immediately, his prosecution was the decisive issue and brought about the defeat of the Whigs, who had been the political party in power. Consult T. B. Howell, *State Trials*, vol. xvi (London, 1809–26), and Justin McCarthy, *The Reign of Queen Anne* (ib., 1902).

SACHEVERELL, William (1638–91). An English politician. He was elected to Parliament for Derbyshire in 1670. In 1673 he began the movement which brought about the downfall of the Cabal (q.v.) and the passage of the Test Act (q.v.). His hostility to the court policy, however, continued unabated. Especially did he advocate a return to the Triple Alliance of 1668 between England, Spain, and Holland. Sacheverell was the first man who openly suggested the exclusion of the Duke of York from the succession. He made the proposal in 1678 and continued to advocate it even against the wishes of the party leaders. On the accession of James II he was forced into retirement, but with the Revolution he again came into prominence, serving on the committee which drew up the Declaration of Right.

SACHS, sȧks, Bernard (1858–). An American neurologist, born in Baltimore, Md., and educated at Harvard (M.D., 1878) and in the University of Strassburg. After research in Vienna and Berlin he began to practice medicine in New York City in 1883 as a specialist in

nervous diseases. Dr. Sachs first described the disease known as amaurotic family idiocy. He contributed to important medical textbooks and wrote *A Treatise on the Nervous Diseases of Children* (1895; 2d ed., 1905; Ger. version, 1897).

SACHS, zäks, HANS (1494–1576). A German poet and dramatist, the best and also the most prolific of the meistersingers (q.v.). He was born in Nuremberg, the son of a shoemaker, to whose trade he was trained, having first received an education at the town Latin school. After his apprenticeship came years of journeyman wandering. Returning to Nuremberg in 1516, he was diligent alike at his trade and his literary avocation and took earnest but peaceful interest in the Reformation movement. He died in 1576. Though early trained in the rules of the *Meistergesang,* he soon emancipated himself from their excessive pedantry. His versification was always mechanical and his purpose prevailingly didactic, but his humor was exuberant and his imagination fertile. He wrote hymns, some of which did great service to the Reformation in its first decades, fables, allegories, merry tales (*Schwänke*), dialogues, comedies, and Shrovetide plays (*Fastnachtspiele*)—in all some 6300 pieces. Sachs's work continued popular till the days of Opitz; then his fame gradually suffered almost total eclipse till it was revived by Goethe, especially through his *Hans Sachsens poetische Sendung* (1776). The four-hundredth anniversary of his birth was celebrated in New York in 1894. The best edition of his works is in 26 volumes by A. von Keller and C. Goetze (Tübingen, 1870–1908). The best selection is by Gödeke and Tittmann in *Deutsche Dichter des 16ten Jahrhunderts* (2d ed., Leipzig, 1883–85). Consult also: Charles Schweitzer, *Un poète allemand au XVIme siècle: étude sur la vie et les œuvres de Hans Sachs* (Nancy, 1889); Karl Drescher, *Studien zu Hans Sachs* (Marburg, 1891); Edmund Goetze, *Hans Sachs* (Nuremberg, 1894); B. Suphan, *Hans Sachs in Weimar* (Weimar, 1894); id., *Hans Sachs: Humanitätzeit und Gegenwart* (Weimar, 1895); Rudolph Genée, *Hans Sachs und seine Zeit* (2d ed., Leipzig, 1902); Eugen Geiger, *H. Sachs als Dichter in seinen Fastnachtspielen im Verhältnis zu seinen Quellen* (Halle, 1904); H. Holzschuher, *H. Sachs in seiner Bedeutung für unsere Zeit* (Berlin, 1906); M. C. Burchinal, *Hans Sachs and Goethe: A Study in Meter* (Baltimore, 1912). For bibliography, see vol. xxvi of the Tübingen edition (1908).

SACHS, JULIUS (1832–97). A German botanist, founder of the modern science of experimental plant physiology. He was born in Breslau and studied in Prague under Purkinje. He became professor of botany at the agricultural school at Poppelsdorf, near Bonn (1861), at Freiburg (1867), and at Würzburg (1868). Of special importance were his researches on the influence of light, natural and colored, on plant assimilation, and on heliotropic curves. In the matter of assimilation of starch and its test by iodine applications and of culture in nutrient solutions, his work was that of a pioneer, and the same may be said of his law of the three cardinal points in the relation of germination to temperature and of his work on tropism. He wrote: *Handbuch der Experimentalphysiologie der Pflanzen* (1865); a *Lehrbuch der Botanik* (1866; 4th ed., 1874); *Vorlesungen über Pflanzenphysiologie* (1882; 2d ed., 1887); *Geschichte der Botanik* (1875; Eng. trans., 1890); *Gesammelte Abhandlungen über Pflanzenphysiologie* (1892–93).

SACHS, säks, JULIUS (1849–). An American educator, brother of Bernard Sachs, born in Baltimore He graduated from Columbia in 1867, and studied abroad at the universities of Würzburg, Berlin, Göttingen, and Rostock. Between 1872 and 1907 he was principal of preparatory schools, and after 1902 he served as professor of secondary education at Teachers' College, Columbia University. Sachs was president of the American Philological Association in 1890–91 and of the Headmasters' Association of the United States in 1899. His publications include *Syllabus of a General Course on the Theory and Practice of Teaching in the Secondary School* (1909; 2d ed., 1913) and *The American Secondary School* (1912).

SACHSENSPIEGEL, zäk'sen-shpē'gel (Ger., Mirror of Saxony). The best German law treatise of the Middle Ages. It was a private compilation of the customary law of Saxony, made by Eike von Repgow (c.1230). Although not authoritative, it had much influence and was the source of other treatises on law. In 1374, 14 articles were repealed at the order of Pope Gregory XI because they were not in harmony with the teachings of the Church. The best edition is by Homeyer (3 vols., Berlin, 1835–44). Consult J. E. O. Stobbe, *Geschichte der deutschen Rechtsquellen,* vol. i (Brunswick, 1864).

SACK (Fr. *sec,* from Lat. *siccus,* dry). A name given in England in the seventeenth century to the strong white wines from the south of Europe. Originally the term applied to dry light-colored wines and to the punch made by sweetening and flavoring them.

SACKEN, BARON CHARLES ROBERT OSTEN-. See OSTEN-SACKEN, BARON C. R.

SACK'ETTS HARBOR. A village in Jefferson Co., N. Y., 11 miles west of Watertown, on Black River Bay, Lake Ontario, and on the Rome, Watertown, and Ogdensburg branch of the New York Central and Hudson River Railroad (Map: New York, D 3). Madison Barracks (q.v.), a United States military post, Fort Tompkins Park, the scene of a battle in the War of 1812, the Hay Memorial Library, and a United States naval station are noteworthy features. Sacketts Harbor is admirably situated, but its commercial and industrial interests are insignificant. Pop., 1900, 1266; 1910, 868; 1915 (State census), 689.

Founded by Augustus Sackett in 1801, Sacketts Harbor had a score of houses by 1812 and was the centre of a considerable trade with Canada. During the War of 1812 the frigates *Superior* and *Madison* were built here in 80 days and 45 days respectively. On May 29, 1813, the place was unsuccessfully attacked by a British force under Prevost. The English lost 259 in killed, wounded, or missing, while the Americans lost only 23 killed and 114 wounded.

SACK'VILLE. A town and port of entry in Westmoreland County, New Brunswick, Canada, on the Intercolonial Railway, 25 miles southeast of Moncton (Map: New Brunswick, F 5). It is the seat of Mount Allison University and of a ladies' college and has a variety of manufactures. Pop., 1911, 2039.

SACKVILLE, CHARLES, sixth EARL OF DORSET (1638–1706). An English poet and patron of

letters at the court of Charles II. Immediately after the Restoration he was elected to Parliament. For some years he lived a very dissipated life. In 1665 he served as a volunteer against the Dutch, and after this lived a life of leisure, gaining a reputation for his wit and his patronage of letters. Dryden dedicated to him the *Essay of Dramatic Poesy* and introduced him under the name of Eugenius into the dialogue of this famous piece of criticism. He was also a friend of Waller, Butler, and Wycherley, and was beloved by Prior in the next generation. In 1675 he was created Baron Cranfield and Earl of Middlesex. On the death of his father (1677) he succeeded to the earldom. He served three times as Regent during King William's absences. Sackville as poet is best remembered, perhaps, by the poem beginning "To all you ladies now at land." Consult: *Musa Proterva*, edited by A. H. Bullen (London, 1889); T. H. Ward, *The English Poets*, vol. ii (New York, 1896); Samuel Johnson, *Lives of the British Poets*, vol. iii, edited by G. B. Hill (London, 1905).

SACKVILLE, George Germain, first Viscount. See Germain.

SACKVILLE, Lionel Sackville-West, Baron (1827–1908). An English diplomat. The son of the fifth Earl de la Warr, he was born at Bourn Hall, Cambridgeshire. He received a private education, entered the diplomatic service in 1847, and prior to 1868 was attached successively to the British legations at Lisbon, Naples, Stuttgart, Berlin, Turin, Madrid, and Paris. He became British Minister to the Argentine Republic in 1873, to Spain in 1878, and to the United States in 1881. He was a member of the North American Fisheries Commission in 1888. The same year, in the American presidential campaign, a letter now known as the Murchison letter, pretending to have been sent by a naturalized citizen of British birth, requested his views on the attitude of the administration towards England. His answer, which implied that the reëlection of Cleveland would be advantageous to British interests, was published in the New York *Tribune* October 22, and was used with telling effect against the administration until Sackville was handed his passports on October 30. His political career terminated with this incident.

SACKVILLE, Thomas (1536–1608). The first Earl of Dorset and Baron Buckhurst, an English poet and statesman. He was born at Buckhurst, Sussex, in 1536. He joined the Inner Temple and was called to the bar. In conjunction with Thomas Norton (q.v.) he wrote the first English tragedy in blank verse, *Ferrex and Porrex*, afterward called *Gorboduc* (q.v.), performed at the Inner Temple on Twelfth Night, 1561. It is founded on British legend and is molded to the form of Latin tragedy. It has no dramatic life or energy, but the style is pure and stately, evincing eloquence and power of thought. Sackville's other productions (first published in 1563) are the *Induction*, a poetical preface to the *Mirror for Magistrates* (1559–63), and the *Complaint of the Duke of Buckingham*, which was designed to conclude the work. The *Induction* is a noble poem, uniting, as Hallam says, "the school of Chaucer and Lydgate to the *Fairy Queen*." Soon after his father's death in 1566 he was created Lord Buckhurst and became a favorite with the Queen, who employed him in foreign diplomacy. Many places and honors came to him. He went to Parliament as early as 1557. In the spring of 1568 he was sent to France, where he twice negotiated for the Queen's marriage. In 1587 he incurred her displeasure by what she called his shallow judgment in diplomacy and he was confined to his own house as a prisoner for six months. On the death of Leicester he returned to favor. He succeeded Burleigh as Lord High Treasurer (1599). On the accession of James his patent of office was renewed for life and in the following year he was created Earl of Dorset. He was buried in Westminster Abbey. Consult his *Works*, edited by R. W. Sackville-West (London, 1859), and *Gorboduc*, edited by W. D. Cooper for the Shakespeare Society (ib., 1847) and by Toulmin Smith in Vollmöller, *Englische Sprach- und Litteraturdenkmäler* (Heilbronn, 1883). His poetical works were collected in 1859.

SACO, sā'kō. A city in York Co., Me., 15 miles southwest of Portland, on the Saco River, here spanned by four bridges, and on the Boston and Maine Railroad (Map: Maine, B 5). It has Pepperell Park, the Wardwell Home, Thornton Academy, the Dyer Library, the York Institute, and a scientific and historical society, with a museum. The Saco River, which falls 42 feet near the city, affords abundant water power. The industrial establishments include cotton mills, cotton-machinery works, saw and grist mills, and manufactories of pumps, brick, box shooks, belting, and carriages. Old Orchard Beach, 4 miles distant, is a popular summer resort.

The site of Saco was visited by Martin Pring in 1603, by De Monts and Champlain in 1604–05, and by Capt. John Smith in 1614, but no permanent settlement was made here until 1630. Until 1762, when it was separately incorporated as Pepperellboro, Saco formed part of Biddeford (incorporated in 1718). In 1805 the present name, which before 1718 had been applied to Biddeford also, was readopted, and in 1867 Saco was chartered as a city. Pop., 1900, 6122; 1910, 6583. Consult Ridlon, *Saco Valley Settlements and Families* (Kezar Falls, Me., 1905).

SACO RIVER. A river of New England which rises in the White Mountains of New Hampshire at elevations of from 4000 to 5000 feet above sea level, flows southeast through the southwestern part of Maine, and empties through Saco Bay into the Atlantic Ocean (Map: Maine, B 5). It passes through the mountains in the famous Crawford Notch, whose sides are formed by imposing rocky peaks. Its course of about 105 miles is almost a continuous succession of falls, affording excellent water power.

SAC'RAMENT (Lat. *sacramentum*, sacrament, mystery, engagement, military oath, from *sacrare*, to dedicate, consecrate, from *sacer* sacred). The name given to certain religious rites of the Christian Church, as to whose number and effects there has been much controversy, especially since the Reformation. The word means a formula or an object endowed with a sacred significance and was used by the early Christians to mean the most sacred Christian symbolic rites. According to the traditional and most widely held view, a sacrament is composed of two parts, an outward and visible sign and an inward and spiritual grace.

This doctrine is most definitely taught in modern times by the Roman Catholic church,

though the Eastern churches are in substantial agreement with it. The *opus operantis*, or the independent act of the receiver, may add to the effect, but does not produce it. The sacraments are seven in number—baptism, confirmation, communion, penance, unction, orders, and matrimony—all of them held to have been instituted by Christ directly. They are divided into sacraments of the dead and of the living. The former class includes those which are held to give supernatural life or sanctifying grace to the spiritually dead—baptism and penance; the latter are supposed to be received by those who are already in a state of grace. Three of them, baptism, confirmation, and orders, are held to impress a certain character or stamp upon the soul, and therefore cannot be repeated; they are administered conditionally if there is any doubt of their having been duly received. Besides the matter and form the intention of the minister is also held to be essential to the validity of any sacrament. A distinction is made between irregular and invalid administration of the sacraments. Thus, the sacraments administered by a suspended or excommunicated priest would be valid, but not regular, except in the case of a dying person where no other priest was to be had, when such a priest would be allowed to administer them. For the details of the sacraments in their traditional acceptation and use, see BAPTISM; CONFESSION; CONFIRMATION; EXTREME UNCTION; LORD'S SUPPER; MARRIAGE; ORDERS, HOLY; PENANCE.

Under the titles LORD'S SUPPER and MASS the doctrinal and sacrificial aspects of the Eucharist have been covered, but some further details of the history and usages of communion may be given here. The manner of reception has varied considerably at different periods. As to the sacramental bread the question whether it should be leavened or unleavened has caused acute controversies between East and West. In the modern practice of the Roman Catholic church it is a thin unleavened wafer, large and stamped with sacred symbols for the celebrant, smaller for the other communicants, and is placed directly in their mouths by the priest. Reception in the hand, which seems to have been usual in the early ages, is now the common rule in the non-Catholic churches. (For the history of the withdrawal of the chalice from all but the celebrant, see COMMUNION IN BOTH KINDS.) The modern dread of bacterial infection has led to the adoption in many Protestant churches of a small separate cup for each communicant. The frequency of reception has also varied, from apparently every day in the apostolic times to once a month, a quarter, or a year. The latter, for Roman Catholics, has been a fixed minimum since the time of the Lateran Council of 1215. In practice with them it is generally preceded by sacramental confession. The Anglican church makes provision for the celebration of the sacrament in the sick room, but by the Roman Catholic practice it is carried from the church to the sick person.

By the majority of the reformed churches the sacraments are held to be merely ceremonial observances, partly designed as a solemn act by which persons are admitted to membership or make solemn professions thereof, partly intended to stimulate the faith and fervor of the recipient. As to the number of rites called by the name of sacrament, almost all Protestants agree in restricting it to baptism and communion, even though they retain as religious observances some of the rites, as confirmation, which Catholics regard as sacraments. It is contended, however, by the High Church party in the Church of England that Article XXV, which seems to deny the sacramental nature of confirmation, orders, and so on, does not really do so, but merely asserts that they are not on the same footing with the two great sacraments as generally necessary to salvation. The Friends and some other bodies reject all external celebration of the sacraments and regard the spiritual content as being their real essence.

Bibliography. Morgan Dix, *The Sacramental System the Extension of the Incarnation* (New York, 1893); Paul Schanz, *Die Lehre von den Sakramenten der katholischen Kirche* (Freiburg, 1893); F. H. Oswald, *Die dogmatische Lehre von den heiligen Sakramenten* (5th ed., Münster, 1894); J. C. Lambert, *Sacraments in the New Testament* (New York, 1903); Alexander Knox, *Grace of Sacraments* (ib., 1905); A. J. Beet, *The Church, the Churches, and the Sacraments* (London, 1907); P. Pourrat, *Theology of the Sacraments* (Eng. trans., 2d ed., St. Louis, 1915); P. B. Bull, *The Sacramental Principle* (New York, 1915); and most of the general works on dogmatic theology.

SACRAMENT, EXPOSITION OF THE. See EXPOSITION OF THE SACRAMENT.

SAC'RAMEN'TAL CONCOMITANCE. See CONCOMITANCE, SACRAMENTAL.

SACRAMENTALS (Lat. *sacramentalis*, relating to a sacrament, from *sacramentum*, sacrament, mystery, engagement, military oath). A term introduced at the time of Peter Lombard and used in Roman Catholic theology to designate certain rites which partake of the nature of sacraments in so far that they are, if properly used, means of grace, which is conveyed through an external ceremony. While all the sacraments are held to have been instituted directly by Christ, sacramentals are of ecclesiastical institution. The term may be applied either to a material object which is blessed for the purpose or to its employment as a means of grace. A multitude of objects which receive priestly benediction are used in this way; holy water, blessed candles, palms, the ashes used on Ash Wednesday, medals, crosses, scapulars (q.v.), and the like all come under this head. Consult Ferdinand Probst, *Sakramente und Sakramentalien* (Tübingen, 1872), and A. A. Lamburg, *Sacramentals of the Catholic Church* (New York, 1892).

SAC'RAMENTA'RIANS. The name given in the sixteenth century to those among the reformers who separated from Luther on the doctrine of the Eucharist. Luther taught the doctrine of a mystical presence of the body and blood of Christ along with the bread and wine. (See LORD'S SUPPER; LUTHER.) The first of his followers who called this doctrine in question was Andreas Carlstadt (q.v.); and notwithstanding the protest of his leader, Carlstadt had many followers. The party became so considerable that in the Diet of Augsburg (1530) they presented a special Confession distinct from that put forward by the general body of Protestants, known as the Tetrapolitan Confession because written in the name of the four cities, Constance, Lindau, Memmingen, and Strassburg, which were excluded by the Lu-

therans from the Protestant League. It was prepared by Martin Bucer and Wolfgang Capito (qq.v.) and contained 23 chapters. The Confession rejects the doctrine of a corporeal presence, although it admits a spiritual presence of Christ. The four cities continued for many years to adhere to the Confession, but eventually were merged in the general body of Lutherans. Simultaneous with this South German movement, yet independent of it, was that of the Swiss reformer Zwingli (q.v.), whose doctrine on the Eucharist was that in it the true body of Christ is present by the contemplation of faith, but not in essence of reality. His article upon the Eucharist was in substance embodied in the Helvetic Confession of 1566. See Philip Schaff, *Creeds of Christendom*, vol. i (New York, 1881).

SAC'RAMEN'TO. The capital of California and the county seat of Sacramento County, 90 miles northeast of San Francisco, with a 4-mile frontage on the Sacramento River, here spanned by two bridges, and on the Southern Pacific and the Western Pacific railroads and on several electric lines (Map: California, D 4). The city is noted for the charm of its environment. The most prominent feature is the State capitol, which was erected in 1869 and cost $2,500,000. It occupies a site in the central part of the city and is surrounded by a large, picturesque park. Sacramento has three libraries—the State Library of more than 113,000 volumes, the Public Library, and the Odd Fellows' Library. The Christian Brothers' College, Howe's Academy, St. Joseph's Academy, and Heald's Business College are the leading educational institutions. There are a fine city hall, courthouse, United States government building, Crocker Art Gallery, Roman Catholic cathedral, Marguerite Home, Protestant Orphan Asylum, and the Southern Pacific Railroad's hospital. Other fine edifices are the Y. M. C. A., the Women's and Sutter clubs, Elks Building, Travelers' and Sacramento hotels, and Fruit Exchange Building. The annual State fair is held at Sacramento under the auspices of the State Agricultural Society, which maintains here an exhibition building and a park and race course. The city's parks comprise more than 1000 acres, the most important being McKinley, Southside, City Plaza, and Recreation.

The valley of the Sacramento is one of the most productive regions of the State, yielding grain and citrus and deciduous fruits. Manufacturing is extensively carried on, the various establishments in the census year of 1909 having had an invested capital of $10,097,000 and an output valued at $13,977,000. There are three canning factories, flouring and grist mills, foundries and machine shops, harness and saddlery factories, slaughtering and meat-packing establishments, breweries, and manufactories of carriages, furniture, soap, candy, brooms, sewer and water pipe, pumps, mattresses, crackers, and lumber products. Shops of both railroads also are here. Pop., 1910, 44,696; 1915 (U. S. est.), 64,806; 1920, 65,857.

In 1839 Capt. John A. Sutter, having obtained from the Mexican government a grant of a large tract of land in this vicinity, built here a fort which he called New Helvetia. This fort, which has been rebuilt and is preserved for its historic interest, was the first point in California reached by miners coming from the East in 1848. In this year a village called Sacramento was laid out. It was incorporated as a town in 1849, became the State capital in 1854, and was chartered as a city in 1863. The commission form of government has been adopted.

SACRAMENTO PERCH. A basslike fish (*Archoplites interruptus*) of the Sacramento and San Joaquin rivers and tributary lakes, the only fresh-water percoid west of the Rocky Mountains. It is an excellent food fish, from 1 foot to 2 feet in length, dark-colored, with the sides marked with about seven irregular dark bars. This fish is liable to be exterminated by the carp and catfish, which infest its spawning grounds. See Plate of PERCHES.

SACRAMENTO PIKE. A large greenish chub, 2 to 4 feet in length (*Ptychocheilus oregonensis*), which abounds in the rivers of the Pacific coast and is used as food. Other names are squawfish and chappaul. See Plate of DACE AND MINNOWS.

SACRAMENTO RIVER. The principal river of California (Map: California, C 3). The area drained by the main stream and its tributaries extends from Suisun Bay northward to Mount Shasta and from Trinity Mountains and the Coast Range eastward to the Sierra Nevada. This basin is about 230 miles long and about 150 miles wide, and comprises about 27,100 square miles. The head stream which bears the name of the main river rises on the western slope of Mount Shasta, in the northern part of the State, but it soon receives from the east the much larger and longer Pitt River. From the junction the main river flows southward for about 370 miles and discharges into Suisun Bay, about 50 miles by water above San Francisco. It is navigable to Red Bluff, about 250 miles from its mouth. The river receives numerous tributaries from the Sierra Nevada and the Coast Range, on many of which there has been a great deal of gold mining. The valley of the Sacramento is very fertile, becoming marshy towards the junction with the San Joaquin. The basin contains many excellent storage sites, several of which have been surveyed by the Reclamation Service.

SACRA'RIA (SACEL'LA) AR'GEO'RUM, or ARGEI. The name given by the ancient Romans to certain sanctuaries, 27 in number. Varro (q.v.) so describes the position of 12 that it has been possible to locate 11 of them with almost absolute certainty. On March 17, annually, a procession made the rounds of the sacraria. The name "argei" was given also to puppets fashioned of rushes to resemble men bound hand and foot. On May 14 a procession of priests, vestals, and the magistrates, after making the rounds of the sacraria, went to the Pons Sublicius; there the vestals flung the puppets into the Tiber. Some scholars have accepted the popular Roman view that the rush puppets were substitutes for the human victims sacrificed in earlier times. (See G. Wissowa, *Religion und Kultus der Römer*, 2d ed., Munich, 1912.) Others have held that in the immersion of the puppets we have "semidramatic performances rather than sacrificial rites" and that its object was to procure rain. Consult Fowler, *Roman Festivals*, 111–121 (London, 1899).

SACRED BARK. See CASCARA SAGRADA.

SACRED GROVES. See GROVES, SACRED.

SACRED HARMONIC SOCIETY OF LONDON. An important English musical organiza-

tion, organized in 1832 for the performance of oratorios and sacred music generally. It became famous for its extraordinary performances of Handel's work at the Handel festivals, which were begun in 1857 at the Crystal Palace, Sydenham. As many as 3000 singers have frequently been assembled with an orchestra of 500 pieces. Sir Michael Costa was conductor of the society from 1848 up to 1882, when the society was dissolved. After two attempts at reorganization the association ceased to exist in 1888. Its large and very valuable library was acquired by the Royal College of Music.

SACRED HEART, Ladies of the. A religious society of the Roman Catholic church, founded at Amiens, France, in 1800, by Madeleine Sophie Barat, under the direction of Father Joseph Désiré Varin, S.J. The object of the society was the education of young ladies of the higher classes. The constitution was approved by Leo XII in 1826; a house was opened in Rome and branches were established in many cities. The first house in the United States was established by Bishop Dubourg in 1818, near St. Louis. The society has now about 140 houses in various parts of the world and 6500 members. The mother house was transferred from Paris to Brussels in 1909. For the story of its beginning, consult L. Baunard, *Histoire de Madame Barat* (2d ed., Paris, 1900; Eng. trans., Roehampton, 1876; abridged, 1893).

SACRED HEART, League of the, or Apostleship of Prayer in League with the Sacred Heart of Jesus. A pious confraternity founded at Vals in France in 1844 by Father Gautrelet, of the Society of Jesus, with the intention of cultivating an apostolic spirit among the young Jesuit students who were in the seminary there. It soon spread throughout France and thence to other countries and to the missions. Gautrelet's foundation was organized and perfected by Father Henri Ramière, S.J., who also gave it renewed life and vigor and founded the *Messenger of the Sacred Heart of Jesus* as a monthly organ of the association. This was soon reproduced in several languages and circulated throughout the world. Pius IX granted the association many indulgences and the Congregation of Bishops and Regulars at Rome approved of its statutes in 1866. After this it grew very rapidly. Leo XIII revised its statutes in 1896. The moderator general is the general of the Jesuits. His deputy controls the association with the help of the editors of the *Messenger of the Sacred Heart.* The circulation of the New York *Messenger* is nearing 500,000. In the world there are more than 62,500 centres, more than 6685 in the United States. The organization has over 25,000,000 members, of whom more than 4,000,000 are in the United States. The purpose of the organization is by prayer to unite with the efforts of missionaries throughout the world for the conversion of souls and for the betterment of true believers. Consult *Manual of the Apostleship of Prayer* (33d ed., New York, 1900) and Ramière, *Apostleship of Prayer* (Eng. trans., ib., 1890).

SACRED HEART OF JESUS, Feast of the. A festival of the Roman Catholic church, celebrated on the Friday after the octave of Corpus Christi. The feast of the Sacred Heart originated in the latter half of the seventeenth century and was established because of certain revelations made to Marguerite Marie Alacoque, a French nun of the Order of the Visitation, who lived at Paravle-Monial in Burgundy. She related that the Saviour appeared to her on a number of occasions, showed her his wounded heart, and bade her institute a new office in his honor. The devotion to the Sacred Heart was gradually propagated in France and at length was approved by Pope Clement XII in 1732 and more formally in 1736 and by Clement XIII in 1765. The spread of the Apostleship of Prayer in League with the Sacred Heart of Jesus (see Sacred Heart, League of) has given a fresh impulse in recent years to this devotion. In 1899 Leo XIII lent the weight of his approbation to the devotion by consecrating the whole Christian Church in a special manner to the Sacred Heart. Consult Gallifet, *The Adorable Heart of Jesus* (New York, 1887).

SACRED MONKEY. See Langur, and Plate of Monkeys of the Old World.

SACRED MOUNT. See Mons Sacer.

SACRED MUSIC. From the earliest times music has been connected with the religious cult of all nations. The part it has played in the religions of the Egyptians, the Greeks, and the Hebrews is discussed under Egyptian Music, Greek Music, and Hebrew Music; the present article treats merely of sacred music as it is identified with Christianity. The early Christian Church adopted its music from the Hebrews. Besides the liturgy hymns were also used. When, towards the end of the fourth century, antiphonal singing was introduced in the rendering of the psalms, they were regarded as a class by themselves, because two choruses answered each other, whereas in the hymns the entire chorus sang all the verses. Psalms were always preceded by an antiphon, a short piece written in the same tone as the following psalm. Harmony at that time was unknown and the music consisted of a kind of recitation known as plain chant. About the end of the fourth century St. Ambrose collected the various chants used in the Church, arranged them systematically, and promulgated certain rules for their proper execution. He is also credited with the introduction of the four authentic modes. (See Modes.) Afterward the Hellenic popes added many new hymns and distributed the various chants so as to cover the services for the entire Church year. They likewise increased the modes by the addition of the four plagal modes. When polyphonic music arose composers selected their texts entirely from the liturgy of the Church. The old plain-chant melodies became the *cantus firmus.* But soon popular melodies were introduced. The famous vesper canticle *Magnificat* received its first polyphonic setting probably by Josquin Deprès (died 1500). After the invention of the descant (q.v.) it was customary to sing the alternate verses in plain chant and faux-bourdon. Josquin and the earlier polyphonic masters, including even Palestrina, were strongly influenced by this custom, and carried it to such an extent that they retained the plain chant for the odd verses and composed only the even verses.

Bach's Mass in B minor marks the modern method of the composition of masses. Modern masses no longer exhibit characteristics of schools, but of individual composers. Although we have polyphonic masses dating from the fourteenth century, the mass for the dead, the requiem, attracted the attention of composers

much later. The first great polyphonic requiem was written by Palestrina. The character of some modern requiems approaches that of the oratorio.

In connection with the development of the mass we find the form of the motet, first cultivated by De Vitry about 1300. The text was always Latin selected from the offices of the Church. When the school of the Netherlands (see MUSIC, HISTORY OF, III) was at its height, every composer of note wrote one or more masses, each bearing the name of the popular melody which was used as a cantus. In the course of time this practice led to abuses and seriously detracted from the dignity of the Church style, so that the Council of Trent appointed a commission of cardinals and musicians of the Papal Chapel to restore Church music to its original purity. At no time had the plain chant been discontinued. In fact it was the only music that had ever been officially sanctioned by the Church. At this crisis Palestrina came forward and composed three masses in the polyphonic style. The commission decided that the contrapuntal art was not incompatible with the dignity and simplicity essential to Church music. Palestrina continued to compose masses in this style and also set to music the services used during Holy Week, the *Lamentations* and *Improperia*. All these works of Palestrina and the other masters of the Roman school were written strictly *a capella*, i.e., without instrumental accompaniment. This style has ever since been known as the Palestrina style. The masters of the Venetian school introduced the orchestra into the Church and thus brought about a new style in which the individuality of the composers found greater freedom of expression. See MUSIC, HISTORY OF, V–IX.

The Reformation wrought a great change in the forms of Church music. The introduction of congregational singing gave rise to the chorale (q.v.). At first popular melodies were taken and adapted to German words; then composers began to write original melodies. In England Protestant composers took the form of the motet and wrote their music to English words. Thus arose the anthem (q.v.). In 1559 by a decree of Elizabeth the anthem became an essential element in the Anglican ritual. In respect to form a distinction was soon made between the full anthem and the verse anthem, the former containing more choral writing, the latter more solo numbers. In Germany the anthem was developed by the immediate predecessors of Bach into the Church cantata (Kirchenkantate) (see CANTATA), and Bach himself marks the culmination of this form. Bach's cantatas are more elaborate than the anthems, especially in the treatment of the instrumental accompaniment.

Independent of the Church service there arose the form of the oratorio (q.v.). Catholic composers originated this form about 1575, and German and English Protestant composers adopted it. The German masters confined themselves in the selection of the texts to the Passion of Christ as related in the Gospels. They introduce the character of the narrator and made free use of the chorale, thus adding an element of pious contemplation. In this form the oratorio became the Passion oratorio, or, briefly, the Passion (q.v.). The perfection of this form is reached in Bach's *Passion According to St. Matthew* (1729). See AMBROSIAN CHANT; ANTHEM; ANTIPHON; CANTATA; CANTUS FIRMUS; CHORALE; HYMNOLOGY; IMPROPERIA; MASS; MODES; MOTET; ORATORIO; PALESTRINA; PASSION; PLAIN CHANT; POLYPHONY; REQUIEM; SEQUENCE; STABAT MATER.

SACRED ORDER. A Siamese order for members of the royal line, founded in 1851 and reorganized in 1869. It had previously been a personal decoration of the King. The insignia comprises a rosette surmounted by a crown and set with nine different jewels. The ribbon is yellow, edged with red, blue, and green.

SACRED PALACE, MASTER OF THE. See MAGISTER SACRI PALATII.

SACRED WARS (Gk. *ἱεροὶ πόλεμοι, hieroi polemoi*). The name given to the wars waged at the instigation of the Amphictyonic Council (q.v.) in Greece in behalf of Delphi (q.v.). On the ground that the Phocian cities of Crissa and Cirrha had maltreated women returning from the shrine and had exacted too heavy toll from pilgrims to Delphi, war was made on Cirrha about 596–586 B.C. and the city was destroyed. About 357 B.C. the Phocians were charged with having cultivated ground sacred to Apollo and were heavily fined by the Amphictyonic Council. They retaliated by seizing Delphi, and by the aid of the treasure prolonged the war for 10 years, when they were finally overpowered by Philip of Macedon, father of Alexander the Great. On a similar accusation made in 339 B.C. by Æschines, the Amphictyons declared war against the Locrians and made Philip commander in chief. When his operations seemed to be directed against Athens, Demosthenes succeeded in forming an alliance with the Thebans and the struggle ended in the battle of Chæronea, which put Greece at the feet of Philip. A war between the Phocians and the Delphians in 448 B.C. also figures as a sacred war.

SACRED WAY (Lat. *via sacra*, Gk. *ἱερὴ ὁδός, hierē hodos*). 1. A famous road leading from Athens northwest to Eleusis (q.v.). It issued from the city at the Dipylon Gate, passing through the Ceramicus and continuing through the Pass of Daphne. It was the route of the great annual procession of the mysteries and was for the greater part of its length lined on both sides with tombs, many of which are preserved, together with remains of shrines and temples. Consult Baedeker, *Greece* (4th Eng. ed., Leipzig, 1909). 2. The most important street of the ancient Roman Forum, forming the chief means of communication with the capitol. Starting near the Meta Sudans (q.v.) in the hollow near the Coliseum, it passed between the Palatine and the Oppian, leading through the arch of Titus, thence diagonally between the temple of Vesta and the Regia to the Vicus Tuscus, past the Basilica Julia to the summit of the Capitoline, a total length of about 860 yards to the foot of the ascent, which in Imperial times was called the Clivus Capitolinus. The road received its name, it was said, from the three sacred huts of Vesta, of the high priest, and of the penates brought from Troy. In early times it was divided into three sections, *infima, summa,* and *clivus sacer*. Its classic name was retained down to the ninth century. Consult Christian Hülsen, *The Roman Forum: Its History and its Monuments*, English translation by J. B. Carter (2d ed., Rome, 1909), and S. B. Platner, *The*

Topography and Monuments of Ancient Rome (2d ed., Boston, 1911).

SACRIFICE, săk'rĭ-fīs (Lat. *sacrificium*, sacrifice, a making sacred, from *sacer*, sacred + *facere*, to make). An offering to a spiritual power of something consumed in the service of that power. The word therefore includes the rite and the thing that is sacrificed, but excludes in the latter case, except when used metaphorically, such objects as are made over to a deity without being consumed (lands, temples, etc.). Usually the sacrifice is food and the deity is supposed to eat it or its essence, sometimes only the blood (life) of the victim. In the developed ritual a sacrifice is generally made by an appointed priest (q.v.). Not all priests, however, are sacrificers. Sacrifices are sometimes divided, as among the Romans, into honorific, to express reverence or homage, and piacular, to atone for sin. In either case the motive in making a sacrifice is the counterpart of that which induces a man to make an offering to another man. The simplest form of sacrifice is when grain is flung upon the ground for spirits. But as this is usually the accompaniment of a family meal, so a great feast in honor of gods is merely an extension of the same idea. Such a sacrifice may be either vegetable or animal. There is further, besides the simple vegetable sacrifice, the sacrifice made by offering intoxicating liquor, usually as an accompaniment of a feast, such as the beer sacrifice to Odin, the soma sacrifice to Indra, and parallel offerings and rites among the Aztecs. Among animal sacrifices, as man is the best animal, human sacrifices have always held a prominent place. They were common in Mexico, Peru, and some islands of the Pacific, were known among the Semites, not unusual among the Greeks and Romans (in a veiled form), and from time immemorial have been occasionally performed in India. The fruit sacrifice is sometimes clearly an afterthought, typifying a revolt against the cruelty of animal sacrifice. Thus, in the Vishnu cult of India only vegetable sacrifices are permitted. In such a case for animals are substituted cakes in the likeness of animals, or small animals first take the place of large animals and are in turn exchanged for effigies (as in some Brahmanic rites); or, instead of being sacrificed, a victim is only beaten or otherwise maltreated, as in expiatory rites. The same notion survives in the mutual abuse at festivals, originally a means of purification.

In case of piacular sacrifice the gift serves as an atonement. This gift is usually the life (blood) of the sinner or of his substitute, but it may be merely a dish of food. In a totem system the sin committed by the clan is often expiated by the sacrifice of the totem animal or some man of the clan. In proportion to the god's anger the gift must be precious, and even the chief of the clan or his children must suffer. No sacrificial altar is needed for primitive rites, but as gods are or dwell in stones, fire, or water, gifts are made at the stone or thrown into the fire or water. In the former case, however, even after the conception of the divinity has changed and the god is supposed to live in heaven, he is still imagined either to come to the stone or to smell the sacrifice offered thereon. If the sacrifice is burnt the smoke carries its essence upward as a "sweet savor" to the god. Many religions, moreover, have the extension of piacular sacrifice known as the scapegoat. In this conception sin, like disease, clings to a man, but may be put off upon some one else, who is either driven away burdened thus with sin or is slain for the real sinner. The proxy sacrifice is a redeemer. In the Brahmanas we read that an animal sacrifice on a certain occasion represents a man who has bought himself off by means of the animal. Redemption implies atonement, but atonement does not imply redemption. The mystical sacrifice of the Greeks, Semites, Mexicans, and other races is always an atoning sacrifice, and the victim represents the offended deity because the clan is of his blood; and by partaking of this blood, which symbolizes life, the clan renew their strength in communion with their god. (For various Christian views of the sacrifice of Christ and its effect, see ATONEMENT.) According to the view of the Roman Catholic and Eastern churches, Christianity is still, by the daily re-presentation of the one offering of Christ, essentially a sacrificial religion. For an exposition of this view, see MASS.

The piacular sacrifice has been explained by Robertson Smith as a development from a totem offering, consisting originally in smearing a sacred stone or other object with wine and blood, in which the life of a member of the brotherhood is required (whereas in the commensal meal there is a feast). According to some scholars all sacrifices have their origin in the same cult and originally expressed, by a sacrificial feast, the feeling of union between the clan and its god. This seems too narrow an explanation for the origin of sacrifice. We have a mass of evidence pointing to the fact that sacrifice may be without implication of any blood fellowship. Sometimes there are symbolic sacrifices. There can be no doubt, e.g., that thuggery belongs to this class. The goddess of thuggery is the goddess Kali, to whom as representative of life human victims are offered. In the holocausts offered to the Aztec deities there was no expiation, but only propitiation by means of victims sometimes alien and sometimes native. The human sacrifices offered by the Assamese and by the Khasis, or again by the intermediate Naga tribes, are both expiatory and propitiatory. The Khasis, e.g., kill (and eat) a stranger as a piacular rite to Thlen (the dragon); the Nagas expiate sin by sacrificing slaves (not of the same stock) and enemies captured in battle; and in Assam the privileged victims (feasted and petted till execution, as in Mexico) are strangers, though they are piacular as well as honorific victims. Such cases point to a wider conception of sacrifice than that put forward by those who deduce all sacrifice from one origin. In its simplest aspect sacrifice is often a gift intended to propitiate any spirit and not a renewal of a blood bond nor an expiatory rite. Demonolatry has its sacrifices, their motive to please as well as to benefit the spirit.

In view of the facts here cursorily considered, instead of starting with the assumption of totemism and endeavoring to explain all sacrifices as either a totemic commensal feast shared by gods and men or a piacular rite, it will be better to divide sacrifices into three main classes, as follows: (1) offerings made to goblins, ancestral spirits, or other spiritual powers, to propitiate them, such as grain to bhuts

(beings) and tithes to a king god; (2) offerings made as a feast to great gods (distinguished guests), the sacrifice consisting of vegetables or of animals or human aliens, often of intoxicating liquor, the idea of both (1) and (2) being that of a friendly gift, though (2) may in a totemic environment be a brotherhood feast; (3) sacrifices, either vegetable or animal, made to expiate sin. In a totemic environment a clan member is the victim, but often an alien; in many cases only the life is demanded and the flesh is not eaten when an animal (including man) is sacrificed. These forms are not always distinguishable. A cannibal feast may be expiatory and may not be a commensal feast with the god. On the other hand, it may be commensal with the god and yet expiatory. As a general thing piacular sacrifice is not primitive, but secondary, when ethical feeling is developed. Among savages sin against a god has no ethical side. A demon's wrath is simply inferred from trouble presumably caused by the god. The sacrifice is not to remove sin, but to avert anger, the usual cause of anger being a supposed neglect of the god, who has not enough food to satisfy him. Besides benefiting or revering a spirit, a third motive lies in pleasing a god by depriving one's self of something valuable; but this is included in the gift notion, which may be inspired by this idea rather than by the notion of benefiting the god.

Sacrifice among the Hebrews. The Old Testament presents sacrificial customs belonging to at least three different periods, the pre-Mosaic, the Mosaic, and that which resulted in the postexilic ritual; there are also many references to alien rites which intruded into the Israelitish religion. The Hebrew sacrificial ideas are of common origin with those of the other Semites and may have been influenced by the Babylonian religion, but withal the Hebrew system was original enough to make its own selection and to develop in its own way. The earliest sacrifices seem to have been associated with feasts in which the god had his part. The materials of sacrifice were of two kinds, flesh and vegetable. In the former the Jewish ritual is distinguished by the limitation to domestic food animals, viz., the bull, sheep, goat, turtledove, and pigeon. It would seem that in the early period these animals were only killed for sacrifice, and some sacredness attached to their slaughter till the time of the Deuteronomic code. (See Deut. xii.) As the most valuable food and as the most typical because of its life, flesh was the preponderating element of sacrifice, and *zebakh*, meat sacrifice, is the general word for sacrifice. The vegetable sacrifices consisted of all cultivated vegetable products, either in the raw state or in cakes of flour kneaded with oil and salted, also sometimes incensed. In the later ritual there is no libation of wine or oil, and leaven or other fermenting component was tabooed, with one exception. (Lev. vii. 12.) The sacrifices may be divided into three classes—the tribute sacrifice (*minkhāh*, oblation); the commensal (*shelem*, peace offering); the propitiatory, divided into several classes. In the first kind the worshiper rendered back to God, as the liege lord of the land, a typical part of his bounties. This included the first fruits (q.v.) and the tithes of his fields and flocks. The commensal sacrifice consisted in the sacrifice and the consumption by family or clan of an animal; it involved a sacramental meal, with all the necessary accompaniments of a banquet, bread, wine, etc. The Passover is an example. Here the primitive idea was of the common consumption by the divinity and his people of the same food, the portion consumed in the flame and the blood spilt on the ground being the god's portion, the rest of the carcass being that of the worshipers. While this was the prevailing sacrifice earlier, the later code made it yield to the third kind, the propitiatory. With the growth of ethical consciousness and of the sense of guilt towards offended Deity, and with the development of the transcendental idea of God, the festal, sacramental character of sacrifice was replaced by a solemn act of animal sacrifice to God, in which at the most only the priests shared. Such rites atone for human sin by propitiating God. Here are several classes, in all of which the blood appears as the atoning element. First, there is the whole burnt offering (*'ōlāh*, *kālīl*), in which class belonged the stated daily sacrifices. Secondly, the sin-offering (*khaṭṭāth*), in which the fat was offered in fire, the flesh being burnt without the sanctuary or, in individual offering, falling to the priest. To this class belonged the supreme sacrifice of the later ritual, that of the Day of Atonement. The guilt or trespass offering was accompanied with a restitution for some specific offense. To this general department also belong the sacrifices of purification. In early times the sacrificer was the paterfamilias, chieftain, or king; in the later development sacrifice was confined to the Aaronic priesthood.

Sacrifice among the Greeks and Romans. With the Greeks sacrifice offered to the gods of the upper world was a share in the daily or public meal, a rendering to them of a portion of the good things enjoyed by men. It is probable that in a sense every slaughter of a beast for food was accompanied by an offering of some parts of the animal to the god. In these bloody sacrifices there were many differences in the ritual, depending on the city, the god, and the period, but the main features of the common rite show no great variation. The victim was adorned with garlands and fillets, and the horns of cattle were frequently gilded. A basin of water was consecrated by plunging into it a brand from the altar, and the spectators, animal, and altar were sprinkled. Then barley groats mixed with salt were passed about, strewn on the victim, and thrown by those present into the fire. Hair was then cut from the brow of the animal and thrown into the fire, thus dedicating it to death. Then in solemn silence the victim was killed by cutting the throat, with the head turned back so that the blood might spurt upward. Large animals were first stunned with an axe. The blood was thrown on the altar and parts of the entrails, bones, and a little flesh, along with incense, burned for the gods. From these sacrifices must be distinguished those offered to the gods of the lower world, to the heroes or the dead, where the blood was allowed to flow into the earth and the entire victim was consumed or otherwise destroyed, as when animals were cast into the sea, rivers, or subterranean caverns. In these offerings we find dogs and animals unfit for food sometimes slain. Besides these bloody sacrifices unbloody offerings of fruits, wine mixed with water, honey, milk, and especially cakes, were very common. Cakes in the

form of animals were used by the poor as substitutes for the more expensive victims. No wine was ever offered to the gods of the lower world. Their libations were honey, milk, and water. At some altars only bloodless offerings were allowed.

Among the Romans offerings were made daily and on special occasions by the family to the lares, penates, and other household gods. In their simplest form these consisted of the articles of daily food, milk, wine, beans, grain, cakes of many shapes and sizes, garlands, first fruits of the flock or field, or incense. Similar were doubtless the public offerings of the early religion, and this simplicity was long preserved, accompanied by an elaborate and minute ritual. Thus, in certain sacrifices the victim must be slain by a flint knife; elsewhere only handmade earthenware vessels could be used, or the grain must be pounded, not ground. The swine was perhaps the commonest animal sacrificed, and the great offering was the suovetaurilia (q.v.), or boar, ram, and bull. In the developed ritual the state sacrifices were usually bloody, and the choice of the animal was regulated by minute rules, which prescribed the color, age, and sex, as well as the kind of victim appropriate to the god or the occasion. The ceremonial of the sacrifice consisted in a careful inspection of the victim, which was then brought to the altar decked with garlands, ribbons, and fillets. Here the offerer first threw incense and wine into a fire by the altar and then symbolically slew the victim, the actual killing and cutting up being performed by servants. The *exta* (heart, lungs, liver, etc.) were carefully examined to see that they were perfect, then cooked, and offered on the altar to the god; the remainder of the animal was eaten by the priests and officials or, in the case of private sacrifices, by the worshiper and his friends. In the case of foreign gods other rituals, especially the Greek rite (*græcus ritus*), were followed. See NATURE WORSHIP; SHAMANISM; TOTEMISM.

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SACRIFICE, THE. An opera by F. S. Converse (q.v.), first produced at Boston, March 3, 1911.

SACRIFICIAL VESTMENTS. See COSTUME, ECCLESIASTICAL.

SAC'RISTAN (OF., Fr. *sacristain*, from ML. *sacristanus*, sexton, from *sacrista*, sacristan, from Lat. *sacer*, sacred). A title applied in the Roman Catholic and Anglican churches to the official who has the care of the sacristy and the sacred vessels, vestments, and other valuables contained in it. The duties of the sacristan were originally performed by a separate class of clerics, the doorkeepers, who constituted the lowest of the four minor orders. (See OSTIARIUS.) The term "sacristan" has become corrupted into sexton and the two terms are sometimes used interchangeably, although the sacristan proper has a more responsible office. In cathedrals and collegiate churches he is usually a dignitary of the chapter; in the English cathedrals one of the minor canons.

SAC'RISTY (ML. *sacristia*, vestry, from *sacrista*, sacristan). An apartment attached to a church, in which are kept the sacred objects used in the public worship and in which the clergy and other functionaries who take part in the service assemble and prepare for the ceremonies on which they are about to enter. In many European churches the sacristy is a spacious and costly building. Anciently there was a distinction between the sacristy, where the vestments were kept, and the treasury, where the books and vessels were guarded, these two chambers being placed on the right and the left of the apse of the church, where they were replaced in the Middle Ages by the side apses and chapels.

SAC'ROBOS'CO, JOHANNES DE, JOHN OF HOLYWOOD, or HALIFAX (died in 1244 or 1256). An English mathematician, probably born at Halifax in Yorkshire. He was educated at Oxford, entered the University of Paris about 1230, and afterward became professor of mathematics and astronomy there. Sacrobosco was among the first scholars of the Middle Ages to make use of the astronomical writings of the Arabians. His treatise *Tractatus de Sphæra Mundi* is a paraphrase of a portion of Ptolemy's *Almagest* (see ALMAGEST), and no book on the subject enjoyed greater renown as a manual among the scholastics. It was first published in Ferrara in 1472. Sacrobosco's work on arithmetic, known as the *Algorismus*, was first printed at Strassburg in 1488 and was often reprinted. It contains the nine Hindu digits and the zero. He also wrote *De Anni Ratione* (1550). Consult: Halliwell, "Tractatus de Arte Numerandi," in *Rara Mathematica* (London, 1839); Eneström on Sacrobosco's arithmetic, in *Bibliotheca Mathematica* (Leipzig, 1894); D. E. Smith, *Rara Arithmetica* (Boston, 1908).

SA'CRUM (Lat., sacred), or OS SACRUM. A triangular bone situated at the lower part of the vertebral column (of which it is a natural continuation) and wedged between the two innominate bones so as to form the keystone to the pelvic arch. It consists of five vertebræ with their bodies and processes, all consolidated into a single bone. Its anterior surface is concave from above downward and from side to side. The posterior surface is convex and presents, in the middle vertical line, a crest, formed by the fusion of the spines of the vertebral segments of which the bone is composed. The last sacral

vertebra has, however, no spine, and the termination of the vertebral canal is here very slightly protected. See PELVIS.

SACY, sȧ'sē', ANTOINE ISAAC, BARON SILVESTRE DE (1758–1838). One of the greatest of French Orientalists, born in Paris. Being intended for the civil service, he studied law and in 1781 was appointed counselor of the mint. In 1785 he was elected a member of the Académie des Inscriptions. In 1793 he published his *Histoire de la dynastie des Sassanides*, translated from the Persian, with four dissertations. In 1795 he was appointed professor of Arabic in the newly founded Ecole des Langues Orientales, in Paris. In 1806 he became also professor of Persian at the Collège de France and in 1808 was elected a member of the Corps Législatif. He was given the title of Baron in 1813 and in 1832 became a peer of France. With Abel Rémusat he founded the Société Asiatique in 1822. De Sacy greatly furthered the study of Arabic by his textbooks: *Grammaire arabe* (1810; 2d ed., 1831); *Chrestomathie arabe* (1806; 2d ed., 1826) and its supplement, *Anthologie grammaticale arabe* (1829). Other noteworthy works were: *Principes de grammaire générale* (1799; 8th ed., 1852); a translation of Abd al Latif's *Egypt* with notes (1810); an edition of the Arabic book of fable, *Calila et Dimna'* (1816), and of Farid al din Attar's *Pendnâme*, with translation and an Arabic preface written by himself (1819); *Mémoires d'histoire et de littérature orientales* (1818); the *Makamât* of Hariri (1822; 2d ed., 1847–53); *Exposé de la religion des Druzes* (1838). Consult J. T. Reinaud, *Notice historique et littéraire sur M. le baron Silvestre de Sacy* (Paris, 1838), and Hartwig Derenbourg, *Silvestre de Sacy* (ib., 1895).

SADDLEBACK CATERPILLAR. See HOP INSECTS.

SADDLEBACK SEAL. See HARP SEAL.

SADDLE-BILLED STORK. See JABIRU.

SADDLE MOUNTAIN. The culminating group of the Taconic Mountains in northwest Massachusetts (Map: Massachusetts, A 2). The highest peak is Mount Greylock (q.v.), 3505 feet, the loftiest mountain in the State.

SAD'DLERY (from *saddle*, AS. *sadol;* ultimately connected with Skt. *sad*, Gk. ἕζεσθαι, *hezesthai*, Lat. *sedere*, to sit). The general furniture of horses.

An ordinary harness consists of leather straps, simple or padded, and of the various rings and buckles with which these straps are united and fastened, and varies from the simple bridle, collar, and tugs of the plow harness to the intricate and ornate devices used with the state coaches of royalty. In general the horse is controlled by a bridle and bit or by a hackamore; guided by a pair of reins or by a single rein called a jerk line; he pulls from a collar or from a strap across his breast; he is enabled to back his load by means of a strap around his haunches (breeching); and is attached to the vehicle by means of traces (tugs). The bridle consists of a strap passing over the horse's head and supporting the bit at the ends; there are a brow band and a throat latch to hold the bridle in place. The simplest form of bridle consists of a single strap having in it a slit through which one ear of the animal is passed, thus doing away with brow band and throat latch. There is no part of the horse equipment that shows such a variation as the bit, not only in shape, but also in decoration. The shape varies from the simple smooth snaffle to the complex and cruel spade, and the ornamentation from a simple plating of nickel to hand-wrought steel inlaid with precious metals and richly engraved.

The earliest known saddles were those which have been found in Egypt, which were not used for riding, but as the part of a draft harness which bears the load. Probably to the ancient Egyptians, as to the ancient Greeks and Romans, equestrian saddles were unknown. The forerunner of the saddle was the pad or saddlecloth, which was secured to the horse's back by one, two, or three girths. These seats, however elaborately padded, differed from the true saddle in having no tree. Saddles with trees did not come into use among the Romans till about the fourth century A.D. Stirrups did not come into use till three centuries later. Previously the rider mounted from a horse block or with the aid of his spear, and the Roman cavalry were subject to various ills caused by having their legs hanging for hours from the horse's back. Sidesaddles were introduced as early as the twelfth century. They were developed from the pillion or pad on which a lady rode sidewise behind her husband and steadied herself by holding on to his belt. The present type of sidesaddle seems to have come into vogue about 1650, but the third pommel or leaping horn, by which a firm grip is secured, did not appear till 1830.

The saddles of different periods and among various nations differ much in their form and construction. The parts of a saddle are: the tree or foundation, consisting of the pommel or hornlike projection at the front of the saddle, the cantle or hind-bow, and the side bars; the padding, which is sometimes, as in the McClellan saddle, entirely omitted; the skirts, seat, and girth; the stirrups, which are attached to the side bars. The tree is usually of wood, although in some cavalry saddles it is of iron. It is fastened together with tenons and mortises and secured by a covering of canvas or rawhide, which is sewed on wet and then allowed to shrink. The outer covering in saddles of the English type is usually of pigskin. Besides the saddle for horses there are specially constructed saddles for other animals. Consult: P. N. Hasluck, *Harness Making* (London, 1904); *Saddlery and Harness* (Walsall, English monthly, 1907 et seq.); J. C. Jordan, *Art of Making Harness Successfully* (3 vols., Tuskegee, Ala., 1913); Wilhelm Rausch, *Der praktische Sattler* (12th ed., Leipzig, 1914). See APAREJO; PACK SADDLE; PACK TRANSPORTATION.

SAD'DLEWORTH. A woolen-manufacturing town in the West Riding of Yorkshire, England, 11 miles southwest of Huddersfield. Pop., 1901, 12,300; 1911, 12,603.

SAD'DUCEES (Gk. Σαδδουκαῖοι, *Saddukaioi*, from Heb. *Saddukim*). A Jewish sect. According to Josephus (*Ant.*, xiii, 5, 9; xviii, 1, 4) they did not believe in fate, but maintained that man's fortunes depended upon his conduct; denied the immortality of the soul and recognized no other ordinances than those of the Law; did not accept even the authority of their own teachers; were not numerous, but belonged to the best classes, and when they occupied an official position, as rarely happened, generally sided with the Pharisees, because the people would not endure them otherwise. His account of them is disappointingly brief. The references

to them in the New Testament are in harmony with the description given by Josephus. They do not believe in the resurrection of the dead (Matt. xxii. 23) nor in any angel or spirit (Acts xxiii. 8), and are offended with the Christians because they taught the resurrection of the dead in Jesus (Acts iv. 1). They are spoken of as a sect in Acts v. 17; their doctrine or teaching is referred to in Matt. xvi. 12. The Mishna describes other tenets of this sect. They also held that a man was responsible for the damage done by his slave or slave woman (*Yadayim*, iv, 7 b). The Sadducees of Galilee seem to have objected to the Pharisaic custom of writing the name of the ruler together with the name of Moses in the bill of divorcement (ib., iv, 8). The sect as a whole rejected the Pharisaic custom of washing their hands after contact with the sacred books (ib., iv, 6). (See BIBLE, *Canon of the Old Testament*.) But there is no evidence that they accepted only the Law as holy scripture. The origin of the sect is still obscure. It is first mentioned in the time of Jonathan (161–143 B.C.). If the opposition to the Persian doctrine of a resurrection was a motive of forming the organization, this doctrine was known among the Jews in 165 B.C. (Dan. xii). If the name is derived from Zadok —and the uniform rendering of Zadok in the Greek version by Sadduk speaks in favor of this derivation—the hope of a restoration of the Zadokite high-priestly family, overthrown in 170 B.C., or insistence upon the sufficiency of the Law supposed to have been found in the ark by Zadok against the Pharisaic claims for an oral tradition may have caused some conservatives to band themselves together. They were probably a product of the same movement that led some to emigrate and form a new covenant in Damascus. (See ZADOKITES.) These also looked forward to an "anointed one" to come "from Aaron and Israel," i.e., a high-priestly ruler, backward to Zadok as the recoverer of the Law, and with enmity upon the Pharisees. Many scholars, among them Geiger, Wellhausen, Kuenen, Montet, and Schürer, have regarded the Sadducees as nothing else than a group or political party made up of the high priests and their adherents in the aristocratic families. But Hölscher has shown that the representation of the high priests and their adherents as Sadducees is characteristic of the later rather than the earlier sources. It is found in the *Antiquities* of Josephus, written c.95 A.D., in Acts, and in some Talmudic treatises, while Josephus in the *Jewish War* (written c.75 A.D.), Mark, and the Mishna do not suggest that the Sadducees were an ecclesiastical aristocracy. After the fall of Jerusalem in 70 A.D. the name seems to have been used often in a loose manner as a term of opprobrium to stigmatize those who were held responsible for the reverses of the nation. This is so obvious that it becomes doubtful whether even the family of Boethus can be regarded as Sadducees in the proper sense. A large number of the high priests manifestly did not belong to this sect. But Hölscher's contention that the Sadducees were especially hospitable to Greek and Roman thought is not well supported. There is no reason to think of an influence of the Lex Cornelia de Sicariis in connection with their interpretation of Deut. xix, 15–21. Nor is there any evidence that they were skeptics, inclined to mockery, and indifferent in matters of religion. Their peculiar tenets, as has been pointed out by Eerdmans, reveal a genuine concern for a correct understanding of and obedience to the Law and a strong adherence to the ancestral faith. In opposing the doctrine of a resurrection, the current angelology and demonology, and the hedge built around the Law by oral tradition, they showed their conservative temper, regard for the Law itself, and comparatively sober exegesis, rather than any foreign influence. In the absence of any literary document that can with certainty be ascribed to them, it is scarcely possible to determine whether, by refusing to follow the popular trend of eschatological thought, they weakened and impoverished their spiritual life or were able to preserve the purity and depth of religious sentiment so marked in many an Old Testament writer who, like them, was unmoved by the fears and hopes of a life beyond the grave.

Bibliography. Abraham Geiger, *Urschrift und Uebersetzungen der Bibel* (Breslau, 1857); Joseph Derenbourg, *Essai sur l'histoire et la géographie de la Palestine* (Paris, 1867); Julius Wellhausen, *Die Pharisäer und die Sadducäer* (Griefswald, 1874); Edouard Montet, *Essai sur les origines des partis saducéen et pharisien* (Paris, 1883); K. Kohler, "Sadducees" in the *Jewish Encyclopedia* (New York, 1905); Gustav Hölscher, *Die Sadduzäismus* (Leipzig, 1906); Emil Schürer, *Geschichte des jüdischen Volkes im Zeitalter Jesu Christi*, vol. ii (4th ed., Leipzig, 1907; Eng. trans. of 1st ed., New York, 1896); Alfred Edersheim, *Life and Times of Jesus the Messiah* (new ed., London, 1907); B. D. Eerdmans, "Farizeën en Sadduceën," in *Theologisch Tijdschrift*, vol. xlviii (Leyden, 1914).

SADE, DANATIEN ALPHONSE FRANÇOIS, COUNT DE, also known as MARQUIS DE SADE (1740–1814). A French writer, born in Paris. He led a scandalous, licentious life and, besides other writings, published *Justine* (1791) and *Juliette* (1798), two obscene novels. He dared to send a copy of *Juliette* to Bonaparte, and for this was imprisoned, but in 1803 was transferred to a madhouse at Charenton, where he died. The pathological phenomenon of sexual perversion with cruelty, which was described by him, is called Sadism.

SÁ DE MIRANDA, sä dā mē-rän'dä, FRANCISCO DE (c.1485–1558). A Portuguese poet, who wrote in Spanish also. He was born in Coimbra, studied law at Lisbon, traveled in Spain and Italy, and gave up all chance of advancement at court or on the bench to devote himself to poetry. Save for a few of his pastorals (*redondilhas*), all his work bears the impress of the Italian school and he is ranked first of the Petrarchists in Spain and Portugal. Of his eight eclogues six are in Spanish and only two in Portuguese. As an innovator in the drama he was unsuccessful, his plays arousing no popular interest. His complete works, published first at Lisbon in 1595, were often reprinted; the best edition is that of 1885 at Halle, with biography by Carolina Michäelis de Vasconcellos.

SADI, sä'dē (Pers. *Sa'dī*) (c.1194–c.1291). One of the greatest of Persian poets, whose full name was Musharrif ud dīn ibn Muslih ud dīn Abdullāh Sadi. He was born at Shiraz about 1194. The career of Sadi may be divided into three periods, of which the first extends to 1226. These were years of study, which were

spent in Bagdad, whither he had been sent by the atabeg prince, Sad ibn Zengī, and it was then that he came under the influence of Sufiism (q.v.). The dethronement of his patron by the Mongols in 1226 drove Sadi forth on a series of wanderings which lasted until 1256. This period forms the second epoch in his life. In Delhi he learned Hindustani, in which he composed a few poems, and went thence to Yemen and Abyssinia, returning before long to Arabia. After performing the pilgrimage to Mecca several times, he lived at Damascus and Baalbek, and finally as a hermit near Jerusalem. Here he was made captive by a party of Crusaders and was forced to menial drudgery, until he was recognized by a friend at Aleppo and ransomed. The poet married the daughter of his deliverer, but the union being unhappy, he resumed his wandering life. He traveled through northern Africa and Asia Minor, returning at last to his native city, where the atabeg Abu Bekr ibn Sad, the son of his old patron, ruled. Here he spent the last and most important period of his life, from 1256 until his death. Within a year after his return to Shiraz he had composed his *Būstān* or Fruit Garden (also called the *Sa'dīnāmah* or Book of Sadi), a didactic poem in 10 cantos which deals with ethics and kindred subjects. His more popular book, the *Gulistan* or Rose Garden, was written in the following year and still enjoys great esteem in Persia. It is divided into eight gates, which symbolize the eight doorways of Paradise and which treat of the customs of kings, of the morals of dervishes, of the preciousness of contentment, and similar topics. The lyric poetry of Sadi was voluminous. It comprised *Dīwān* or lyrics, *Qasīdas* or eulogies, both in Arabic and in Persian, *Mathnāvis* or elegies, highly artificial *Ghazals* or odes, *mulamma 'āt*, consisting of poems with alternate Persian and Arabic verses of rather artificial character, the *Sāhibbīyah* or Book of the First Minister, forming a manual of statecraft, besides the *Muṭāyabat* or Jests (also called *Xabīāat* or Facetiæ), which are obscene in character and were written at the command of his patron. The editions of the collected works of Sadi usually contain also six (or seven) prose works called *Risālas* or Missions, attributed to him, which are ethicodidactic in content. A *Pand-nāmah* or Book of Counsel, modeled on a poem of Farídu'd-Dín 'Attár (q.v.), bearing the same name, is also often attributed to him, but is probably spurious (ed. and trans. by Wollaston, 1908). The *Kulliyat* or collected works of Sadi were edited by Harrington (Calcutta, 1791–95) and have been repeatedly published in the East, e.g., at Shiraz in 1891. The *Būstān* was edited by Graf (Vienna, 1858) and Rogers (London, 1891) and translated into English by Clarke (London, 1879), Davie (ib., 1882), and Ziauddin Moheiddin (Bombay, 1889); into German by Graf (Jena, 1850), Schlechta-Wssehrd (Vienna, 1852), and Rückert (Leipzig, 1882); into French by J. B. Nicholas (Paris, 1861) and Barbier de Meynard (ib., 1880). The *Gulistan* was edited by Eastwick (Hertford, 1850), Sprenger (Calcutta, 1851), Johnson (Hertford, 1863), and Platts (London, 1874). It was the earliest of all Persian literature to be introduced into Europe, being translated into French by Du Ryer in 1634. It was translated into English by Ross (London, 1823; reprinted, ib., 1890), Eastwick (Hertford, 1852; new ed., London, 1880), Platts (London, 1873), the Kama Shastra Society (Benares, 1888), and Arnold (London, 1899); into French by Gaudin (Paris, 1843) and Defrémery (ib., 1858); and into German by Graf (1846), Schlechta-Wssehrd (Vienna, 1852), and Nesselmann (Berlin, 1864). Partial editions or translations of his lyric poetry have been made by Barb (Vienna, 1856), Gudemann (Breslau, 1858), Bacher (Strassburg, 1879), and Rückert (Berlin, 1893–94). Consult: Nève, *Le poëte Sadi* (Louvain, 1881); Ethé, "Neupersische Litteratur," in Geiger and Kuhn, *Grundriss der iranischen Philologie*, vol. ii (Strassburg, 1896); E. G. Browne, *Literary History of Persia* (2 vols., London, 1906–09).

SADI-CARNOT, sä'dē'-kär'nō'. See CARNOT.

SAD'LER, MICHAEL ERNEST (1861–). An English educator, born at Barnsley and educated at Rugby and at Trinity College, Oxford, where he was a scholar from 1880 to 1884. In 1882 he was president of the Oxford Union Society. He was secretary of the Oxford University Extension (1885–95) and a member of the Royal Commission on Secondary Education (1893–95) and became director of special inquiries and reports in the Education Department, now the Board of Education (1895), professor of the history and administration of education at the University of Manchester (1903), and vice chancellor of the University of Leeds (1911). Sadler received several honorary degrees, including the LL.D. of Columbia University, and in 1911 was created Companion of the Bath by King George V. As director of special inquiries and reports he performed a great service for English education at a crucial period, his own most notable reports being *Problems in Prussian Secondary Education* and *The Unrest in Secondary Education in Germany, France, and Elsewhere.* Later he conducted a series of surveys on secondary and higher education in various parts of England and he edited a number of important works, including *Continuation Schools in England and Elsewhere* (1907) and *Moral Instruction and Training in Schools* (1908).

SADLER, SIR RALPH (1507–87). An English diplomat. He was born at Hackney, near London, received a classical education, became early associated with Cromwell, Earl of Essex, and through his patronage was employed by Henry VIII in the dissolution of the monasteries and afterward on diplomatic missions to Scotland. In 1539 or 1540 he was knighted and made Secretary of State, and for his gallantry in rallying the repulsed English cavalry at the battle of Pinkie in 1547 he was created Knight Banneret. He was named in Henry's will one of the 12 councilors to the commission of 16 nobles to whom the government was given. Elizabeth called him to the Privy Council and sent him on a diplomatic mission to Scotland, where, in 1560, he brought about the Treaty of Leith. Subsequently he served unwillingly as jailer of Mary, Queen of Scots. Consult *The State Papers and Letters of Sir Ralph Sadler, Knight Banneret,* edited by A. Clifford, with biographical memoir by Sir Walter Scott (2 vols., London, 1809).

SADLER'S WELLS THEATRE. A theatre in Clerkenwell, London, built in 1764 and reconstructed in 1876. It was named from a previous place of amusement on the site, opened in the latter part of the seventeenth century by one Sadler, after discovering an ancient mineral

well, formerly renowned for its curative properties, but long choked up.

SADLIER, săd'lĕr, MARY ANNE (MADDEN) (1820–1903). A Canadian author, born in Cootehill, County Cavan, Ireland. In Canada she married in 1846 James Sadlier. She translated several devotional works, especially De Ligny's *Life of the Blessed Virgin*, and wrote Irish historical novels, of which *The Confederate Chieftains* is the best known, and such novels of Irish immigrants in Canada as *Willy Burke* and *Eleanor Preston*.

SADO, sä'dō. A Japanese island off the north shore of the main island, Hondo, nearly opposite Niigata (Map: Japan, F 4). It has an area of 341 square miles and a population of 120,000. Two mountain ranges, from northeast to southwest, with a cultivated valley between them, constitute the island. The principal formation is limestone. Chalk, which is rare in the rest of Japan, is common here. Sado is locally famous for its gold and silver mines. The capital is Aikawa, a poor town with a population of about 15,000. The chief harbor is Ebisu Minato, on the east coast. The island belongs to the Prefecture of Niigata.

SADOWA, sä'dō-vȧ, BATTLE OF. The name commonly given by French and English writers to the decisive battle of the Seven Weeks' War (q.v.), fought on July 3, 1866, and known to the Germans as the battle of Königgrätz. The Austrian army, with the Saxon contingent of 21,000 men, numbered about 200,000, under the command of Benedek, and occupied a strong position behind the Bistritz, some 7 or 8 miles northwest of Königgrätz. The Prussians numbered about 221,000 men, under the command of King William I of Prussia, who directed the fighting from a hillock near the village of Sadowa. At eight o'clock on the morning of July 3 the Prussians crossed the Bistritz and the First Army delivered an attack in front while the Second Army was sent to operate against the enemy's right. The Prussian centre met with stubborn resistance and after six hours' fighting had produced no effect on the Austrian lines. The movement on the left, however, had succeeded, and soon after two o'clock in the afternoon the Austrian right was in imminent danger. A concerted attack by the Prussian left and centre resulted in the capture of Chlum, the key of the Austrian position, and by four o'clock the battle had been decided, though desperate fighting continued until after nightfall. The Austrians and Saxons lost more than 1450 officers and 43,000 men in killed, wounded, and prisoners, while the Prussian loss amounted to 360 officers and 8800 men. Consult Jähns, *Die Schlacht bei Königgrätz* (Leipzig, 1876), and *Cambridge Modern History*, vols. xi, xii (New York, 1909–10).

SADTLER, sȧt'lĕr, SAMUEL PHILIP (1847–). An American chemist, born at Pine Grove, Pa. He was educated at Pennsylvania College (class of 1867), at Lehigh University, at Lawrence Scientific School, and in the University of Göttingen. He was professor of natural science in Pennsylvania College from 1871 to 1874. In the University of Pennsylvania he was assistant professor of chemistry in 1874–86 and professor from 1887 to 1891, when he became a consulting chemist in Philadelphia and professor in the College of Pharmacy there. He was chemical editor of the fifteenth to nineteenth editions of the *United States Dispensatory*, a member of the committee of revision of the *United States Pharmacopœia* after 1900, and a contributor to the NEW INTERNATIONAL ENCYCLOPÆDIA. Sadtler is also author of *Hand-Book of Chemical Experimentation* (1877); *Industrial Organic Chemistry* (1891; 4th ed., 1912); *Pharmaceutical Chemistry* (1895; 4th ed., 1906), with Virgil Coblentz.

SAEMISCH, zā'mĭsh, EDWIN THEODOR (1833–1909). A German ophthalmologist. Born in Luckau, he studied medicine at Würzburg and Berlin, graduating M.D. in 1858. After having been assistant for several years at ophthalmological clinics at Berlin and Wiesbaden, he settled in Bonn, where, in 1873, he became professor of ophthalmology. Saemisch was the first to describe and to operate upon creeping ulcer of the cornea. With Alfred Karl Graefe he edited the well-known *Handbuch der gesammten Augenheilkunde* (1874–80; 2d ed., 1898–1904). He was also the author of *Beiträge zur normalen und pathologischen Anatomie des Auges* (1864); *Das Ulcus corneæ serpens und seine Therapie* (1870).

SAENZ PEÑA, sȧ-ȧns' pā'nyȧ, ROQUE (1851–1914). An Argentine statesman, born in Buenos Aires. He studied law in the University of Buenos Aires. In 1876 he was elected to the Chamber of Deputies of his native province and a year later was made president of that body. He joined the Peruvian army in the Chile-Peruvian War (1879–83) and was wounded and taken prisoner in the defense of Arica. Returning to Buenos Aires in 1881, he became Undersecretary of Foreign Affairs. Later he founded, with Carlos Pelligrini, the review *Sud América*. He served as Minister to Uruguay, was a delegate to the first International Conference of American States (1889–90), and acted as Minister of Foreign Affairs in the cabinet of Juárez Celman just before the latter's overthrow (1890). He served as Ambassador to Spain (1906) and to Italy (1907–10). Elected President in 1910 on a programme of agrarian reform, he fostered better relations with foreign countries, especially those of Latin America, encouraged immigration from Spain and Italy, and was a leader in the formation of the A. B. C. (Argentina, Brazil, Chile) entente.

ŠAFAŘÍK, shäf'ȧr-zhĕk, PAVEL JOSEF (1795–1861). A Slavic philologist, born at Kobeljarowo, Hungary, and educated at Kesmark and Jena. After acting for two years as a private tutor at Pressburg, he became in 1819 director of the Servian Gymnasium at Neusatz. In 1833 he removed to Prague, where he spent the remainder of his life. From 1837 till 1847 he was a censor and in 1841 became custodian of the library of Prague. In 1848 he was appointed to the chair of Slavic philology, founded at his own suggestion in the University of Prague, but resigned it in the following year. The last years of his life were clouded with insanity. His principal work was the *Slovanské Starožitnosti* (*Slavic Antiquities*) (2 vols., 1837; 2d ed., 1863; trans. into German 1843–44). Important also were his collection of Slovak folk songs prepared in collaboration with Kollar and others (1823–27); *Slovanský Národopis* (*Slavic Ethnography*) (1842; 3d ed., 1849), containing a chart of the Slavic dialects; *Geschichte der slawischen Sprache und Litteratur* (1826; 2d ed., 1869); *Die ältesten Denkmäler der böhmischen Sprache* (1830), in collaboration with Palacký; *Glagolitische Frag-*

mente (1857), in collaboration with Höfler; *Geschichte der südslawischen Litteratur* (3 vols., ed. by Jireček, 1864–65). Consult the article by his son, Bojtěch Safařík, in *Slovník Naučný*, the Czech encyclopædia, vol. ix (Prague, 1872), and Kotchubinski, *Miklosich und Safařík*, in *Archiv für slavische Philologie*, vol. xxv (Berlin, 1903).

SAFE CONDUCT, Letter of. See Letter.

SAFED, sä'fĕd'. A city in Palestine, situated on a mountain 2500 feet high, 13 miles north by west of Tiberias (Map: Palestine, D 2). It has ruins of a huge oval castle built by the Crusaders in the twelfth century. There is a college for instruction in Hebrew and the Talmud. The industries are dyeing and the manufacture of cloth. In 1837 Safed was partly destroyed by an earthquake and more than 4000 persons were killed. Pop., about 25,000, the bulk of whom are Jews, who believe that the Messiah will make Safed his capital.

SAFES AND SAFE-DEPOSIT VAULTS. A safe is a portable structure in which to store valuables, constructed so as to be secure against fire, thieves, and burglars. A safe-deposit vault is built and used for the same purposes as a safe, but is stationary, being part of the building in which it is situated. A safe is made fireproof by building inner and outer walls of sheet iron or steel and filling the space between with plaster of Paris, alum, clay, or concrete, which are nonconductors of heat and contain a large proportion of water. When such a safe is exposed to heat at 212° F., under ordinary pressure the filling material gives off its water of crystallization, which becomes steam. The contents of the safe will be uninjured so long as the steam is maintained; but in a protracted fire there is danger of the water and steam being entirely expelled. A safe is made burglar-proof by building up its walls of layers of alternately hard and soft iron, steel, or franklinite plates of different thickness (laminated structure), or of solid metal plates. Such safes are not always fireproof themselves, but usually they are placed in fireproof buildings or surrounded by masonry. Some are made fireproof by fillings of concrete between their walls, which are made of welded iron and steel, carbonized and decarbonized steel, and crystal steel fastened together by bolts on the inside.

Although there is record of a fireproof safe made in France about 1820 consisting of an inner and an outer metal box with the intervening space filled with a nonconducting material, from about 1826 safes were made of thick oak plank saturated with strong alkali and covered with thick sheet iron, into which huge knob nails were driven. They were secured by a common warded lock, a hasp without any lock, or iron bands with hasps, staples, and padlocks. Many such safes were destroyed in the great New York fire of 1845. From 1829 various metal boxes were developed, formed of a series of plates with different materials used to pack between them. The first real safe, however, was that of Daniel Fitzgerald, of New York, put on the market in 1834, where the space between the iron plates comprising the walls was filled with plaster of Paris, first baked, then reduced to powder, and then mixed with water and mica to the consistency of a paste and poured between the walls. This filling was fire-resisting, but exerted a disastrous chemical action on the iron plates. In 1843 a safe was made where the filling was ground alum mixed with powdered gypsum, which when heated to a high temperature would give off water.

During this period various other materials were used as fillers with more or less success, but it was in 1865 that the concrete filling which is the essential characteristic of the modern fireproof safes was patented by Joseph L. Hall of Cincinnati. This concrete filling consisted of certain cements mixed with steam-producing elements, and the mixture not only improved with age but materially strengthened the entire structure of the safe. This was essential, as in case of fire and the failure of a floor the safe not infrequently fell to the basement and did not possess sufficient strength to withstand not only the shock but the intense heat until the ruins cooled off. Concrete filling naturally has been improved from time to time and is now extensively used.

In addition to the filling of a safe, the structure itself has also been developed. Cast iron is used in the jambs of the door and the body of the safe, as this material will withstand greater heat without warping than bars or plates of steel or iron. The framework of the outer box is made of angles which are securely welded at the corners and thus afford strength to the jamb casing, preventing breakage in case of a fall. With improved framework and various means of reënforcement there followed improved hinges, and, as many safes are designed to be both fire and burglar proof, improvements in the door and frame castings so as to permit of close-fitting doors.

The increase in fireproof building construction has had the effect of a tending away from the extremely heavy safe and towards a light construction that embodies larger interior capacity in proportion to the space occupied. Such a safe of course is less fireproof than one of the heavier type, but is considered adequate in view of modern conditions. With safes of good material and good construction a reasonable degree of security from fire was obtained, and manufacturers naturally turned their attention to protection against burglary and safe breaking. For the larger safes and vaults solid manganese steel, nickel steel, chrome steel, or Harveyized armor steel was employed or else laminated construction. Electrical protection was built in, the locks were adequately protected, and the materials were made drill-proof, so that to-day the modern burglar-proof safe or vault is absolutely drill-resistant and impervious to attack. Its plates usually are formed of five-ply steel, alternate layers of hard and soft steel. These are rolled together and form a plate that when tempered will resist the hardest drill and yet will be strong enough in tensile strength to resist explosives.

Closeness of fit of the door and frame is naturally an essential to a secure safe, and in many safes and bank vaults a round door is employed to attain this end. The jambs, or the union between the door and the frame in the best safes, are polished so that the fit is absolutely perfect and is not concealed by paint or enamel.

In safe construction as practiced to-day there are two general types in use—one known as laminated construction, where alternate layers of open-hearth and five-ply steel are employed, and the other known as insulated construction,

in which an outer section of cast steel containing insulating materials is employed, in which are embedded drill-proof rods or bars, and the inner section of laminated construction. The purpose of the latter form of construction is to eliminate the danger of burning into the vault by using an electric arc, thermite, or an oxy-acetylene flame, in case such modern facilities and time to use them are at the disposal of the safe breaker.

The locking mechanism for a safe or vault is important, as it would seem to be the most vulnerable point of attack. It consists of a handle attached to a spindle which passes through the door and throws the bolts, which are then locked into position by a separate mechanism controlled by one or more combination dial locks. The lock spindles are so carefully ground that no explosive can be forced around them, while the operating mechanism is so nearly balanced by gears and racks that it is simple and positive in operation and not liable to derangement. In some cases an automatic bolt work is employed, the bolts being thrown by springs upon the closing of the door and retracted by another set of springs after the lapse of a predetermined period of time controlled by a time lock. See LOCK.

The time lock is now universally used on all large bank safes and vaults. Before its introduction it was possible for the burglar to awaken the vault's custodian at his home at night and at the point of the pistol compel a disclosure of the combination to the vault. Now no official even can open the vault door until the expiration of the time which was indicated on the dial of the clock inside the door before the vault was closed and locked for the night. On the chance that one of these clocks may stop or break down before the expiration of the time indicated, four of them are used, any one of which will release the locking mechanism.

Large safes and bank vaults have grown in size and massiveness of construction. Where once 8-inch doors were thought satisfactory, they are now frequently 28 inches in thickness, with a total thickness much greater when all the operating mechanism and appliances attached to the door itself are considered.

VAULTS

A modern vault, like a large safe, is built up of alternate layers of steel plates, where plates of unusual toughness and high tensile strength are combined with drill-proof plates of five-ply welded iron and steel, all bound together and protected at the outer and inner corners by steel angles. The plates of adjoining layers are usually laid at right angles to each other, and the arrangement of size is such that the various plates break joints. All surfaces are rolled to perfect planes and the edges and angles are ground to a liquid-proof fit. At the corners the angles are welded into three-way members, so that the vertical and the top and bottom faces of the lining are effectively bound together.

One of the most notable bank vaults of recent construction is that of the Guaranty Trust Company, of New York City, in the basement and sub-basement of its main office on Broadway. This vault is 39 feet, 5 inches by 28 feet, 6 inches, and 28 feet, 5 inches in height outside, while inside its clear dimensions are 34 feet, 7 inches by 23 feet, 8 inches, and 21 feet, 1 inch high. Structurally this vault is a 24-inch shell of concrete in which steel rails have been embedded, and then it is provided with a 4-inch lining of chrome steel and Bessemer steel plates, the outer plate of Bessemer steel being 1½ inches in thickness and the inner of the same material being ¾ inch thick. Two intermediate plates of chrome steel are each 1 inch thick, and all are fastened together by screws, forming a solid homogeneous structure. This vault is founded on sand and is divided into two stories, having a massive door with a modern time lock, giving full protection.

The three-story vault in the J. P. Morgan Building in New York is said to have cost $200,000 and the door affording admittance required a year for its construction and involved an expense of $75,000, weighing with the accompanying vestibule 120 tons. This vestibule is 11 feet, 6 inches in diameter, and the door 9 feet in diameter, with a thickness of 45½ inches, forming an air-tight and water-tight fit when closed by a pressure mechanism. It swings on a crane hinge with two 5-inch bolts controlled by two combination locks actuated by a time lock with four movements.

SAFE-DEPOSIT VAULTS

The safe-deposit vault differs from the safe or ordinary bank vault in several essential particulars—in size, construction, and methods of operation. Primarily it serves the same purpose—the safe-keeping of valuables—but instead of being maintained and operated, as a safe or vault is, by a private individual, a business house, or bank, for its own purposes, it is owned by a company which operates it for the benefit of the public by renting out the boxes and safes contained in it. These are of various sizes to fit individual needs, each with its own key or dial lock. A safe-deposit company, obtaining its right to existence by charter from the State, renders semiannual report of its condition to the superintendent of the banking department or other duly qualified officer. Once a year or oftener a representative of this department makes an official examination as to the conduct of its officers, directors, and trustees, the safety and prudence of management, the security afforded depositors, and whether the provisions of the charter and of law have been complied with.

The powers of a safe-deposit company, as defined in its certificate of incorporation under the laws of the State of New York, consist of "receiving upon deposit, as bailee, for safe-keeping and storage, personal property of value, guaranteeing its safety, and renting safes and vaults for such purpose." In regard to the guarantee it is found in practice that, while the contents of a trunk, chest, or package deposited in the room or compartment intended for the storage of silverware are usually insured by the company (for the value named by the owner) against loss by burglary, theft, or fire, there seems to be no such guarantee or insurance on property placed in the safe-deposit vault. For the company to admit the possibility of insecurity or vulnerability of any kind in this inner fortress would be, not merely a very bad business policy, but a direct contradiction of terms. The advertising of all these companies is emphatic in the assurance that their vaults are

fireproof, burglar-proof, bombproof, and mob-proof. Insurance policies are therefore superfluous. As bailees for hire safe-deposit companies are legally bound to exercise at least ordinary care in keeping property intrusted to them. The burden is upon them of explaining its nonappearance, when such property has been properly deposited. Even where the contract provides that the company shall use diligence that no unauthorized person shall be admitted to any rented safe and beyond this shall not be responsible for the contents of the safe, the court held in a California case that such contract relates to the degree of care required of the company in the identification of parties claiming to be its customers and does not relieve it of its duty as a bailee for hire to guard the property placed in its charge. In case of an attachment by a depositor's creditor under a writ of execution in the hands of the sheriff, the rule of law is equally clear in regard to the company's duty; even here the closest care must be exercised and the strictest inquiry made by the company as to the sheriff's authority, the contents of the writ, and the depositor's title to the property. Similarly when the law gives authority to the representative of the State to examine the contents of the box of a decedent, suitable precautions must be observed.

To insure the complete security of the property stored within the vault, aside from its construction to resist fire and burglary, special precautions are employed by night and by day. At night armed watchmen make rounds and indicate their presence every half hour by suitable records on some form of detector device which may communicate with a central patrol or police station by electric connections. Should a record be omitted the cause of the watchman's failure to perform his duty immediately would be investigated. Electric attachments in some cases connect the bolting apparatus with police headquarters. Some vaults are so completely wired by hidden connections that any interference with any part of them gives an alarm to the electric company's central office.

It is in the daytime, however, that the utmost care must be observed by the vault's custodians. They have to guard themselves then, not against burglars, but against sneak thieves. The vault door is open. Customers pass in and out and, during the busy hours of the day, are there in considerable numbers. It is a matter of some surprise that customers once within the grille (the high iron fence that surrounds the vault inclosure) should freely enter the vault, unlock their safes (after the custodian has applied the master key which turns the lock part way), and then, unguarded, remove their tin boxes which contain their valuable papers or family jewels, and pass and repass out of the vault into the coupon rooms adjoining, and so return. But no person is admitted as a box holder in a safe-deposit vault who has not been properly introduced and able to give reliable references which are promptly investigated; and each one so admitted, for identification afterward, is required to leave his personal description and signature, and is sometimes given a secret pass-word which may at any time be demanded of him by the guard at the grille door.

Many customers or box holders find it necessary to appoint deputies to visit the vault for them. The appointment is made only by power of attorney, signed, sealed, and witnessed; and the same means of identification are required of the deputies as of their principal. It is also necessary to circumvent the carelessness of the box holders themselves, and the ordinary maintenance of a safe-deposit vault is organized on a frank recognition of many varieties of carelessness and mistakes to which customers are subject.

When the day's business is over two officers of the safe-deposit company usually see that the clocks of the time locks are properly set and running, and together they close and bolt each ponderous door of the vault and verify each other's work by testing the bolts after throwing off the dials of the combination locks.

The safe-deposit company not infrequently coöperates with a trust company or bank, or such an institution may supply safe-deposit facilities for its customers. By such an arrangement out-of-town financial institutions, nonresidents, or those leaving the city temporarily may place their securities in vaults to which access can be had only by the joint action of an officer of the trust company or bank and the owner or, in the absence of the owner, by the trust company's or bank's officer and an officer of the safe-deposit company. Thus the deposit, substitution, withdrawal, or sale of securities and the collection of coupons or maturing obligations may be doubly safeguarded. The trust company or bank credits all moneys collected and allows interest thereon; it acts as trustee, guardian, administrator, or agent. The arrangement affords those availing themselves of it the privilege of consulting officers well trained in financial matters in reference to their business and who are competent to act in any emergency in their absence.

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SAFETY, FACTOR OF. See FACTOR OF SAFETY.

SAFETY AT SEA. Notwithstanding the tremendous loss of life in the foundering of the *Titanic* (April 14, 1912) and *Empress of Ireland* (May 29, 1914), sea travel is, in times of peace, comparatively safe. The great shipping disasters are featured so strongly in the newspapers that the public fails to realize how many persons are, in general, carried safely. In the North Atlantic passenger and freight traffic between America and Great Britain in the 20 years from 1892 to 1911 inclusive, the number of voyages made was about 95,000. The crews carried numbered 350,000 persons and the passengers 9,390,000. There were 165 accidents entailing loss of life and they caused the death of 1057 members of crews and 80 passengers. One out of 332 members of the crews and one

out of 117,400 passengers did not reach their destinations in safety. These figures show the greater danger of the freight service, largely owing to the inferior character of the vessels as regards size, equipment, and fitness to meet danger.

In the United States during 1910–14 the average railway passenger was carried 34 miles. The annual passenger mileage was about 33,000,000,000 miles, equal to 11,000,000 passengers carried 3000 miles. Of these, in 1913, 403 were killed and 16,500 injured. The proportion of killed and injured to the total passenger mileage averaged somewhat greater than this during the whole period 1892–1911. The total number of passengers injured in sea travel during the same period was practically nil. It therefore appears to have been about five times as dangerous to life to travel 3000 miles by rail as to cover the same distance by sea, and the chance of serious injury not involving death was at least a thousand times as great by rail as by sea. An inspection of the mortality tables shows that a person is three times as likely to contract a fatal case of pneumonia in any six days of the year as to lose his life in a six days' trip to England.

During the two decades in question (1892–1911) the public confidence in the safety of ocean travel grew steadily, notwithstanding the disaster to the *Norge* (1904) and the sinking of the *Elbe* (1895) and *Bourgogne* (1898). These accidents created a momentary demand for safer ships and more careful navigation. Shipbuilders continued to improve their designs and owners accepted improvements when not too costly, and especially of a kind capable of exploitation by judicious advertising.

Then came the tragic foundering of the *Titanic*. Ships of such great size were thought proof against danger by shipowners, ship captains, and naval architects—safer, barring only such accidents as grounding upon rocks in heavy weather or being damaged by a collision. The foundering of the *Titanic* was soon followed by the burning of the *Volturno* (Oct. 10, 1913) and the sinking of the *Empress of Ireland* and the *Monroe* (Jan. 31, 1914) in collision. The *Titanic* accident showed the inadequacy of double bottoms which did not go beyond the turn of the bilge, the inefficiency of the ordinary method of dividing a ship into compartments, the lack of capacity of the ship's boats, and the defective methods of launching them and embarking the passengers. The sinking of the *Empress of Ireland* in 14 minutes after she was struck emphasized the defects brought out by the *Titanic* inquiry and disclosed new ones; the foundering of the *Monroe* in less than 10 minutes was additional testimony. The *Volturno* was destroyed by fire and did not sink, but the fire rendered her uninhabitable, while a raging sea made it impossible to lower boats for a long time, either from her or from assisting vessels.

The widespread tendency to increase the safety of navigation culminated in the International Conference on Safety at Sea, convened at London, Nov. 12, 1913, and adjourned Jan. 20, 1914. The United States, Austria-Hungary, Belgium, Denmark, France, Germany, Great Britain, Italy, the Netherlands, Norway, Russia, Spain, and Sweden were represented. The conclusions and provisions of the conference were adopted by Germany and by Great Britain in 1914. The United States Senate ratified them, but accompanied the ratification with a proviso reserving to the United States the right to abrogate treaties, agreements, and conventions and to impose such higher standards of safety and provision for health, protection, and comfort of passengers, seamen, and immigrants upon all vessels in United States waters as shall be enacted for United States vessels. The War of 1914 prevented action on the recommendations of the conference by nations other than those named, and the proviso added by the United States Senate practically vitiated all benefits to be derived from its ratification.

The chief recommendations of the conference were:

(*a*) The provisions of the convention and accompanying regulations applied to all mechanically propelled vessels carrying more than 12 passengers which proceed from a port of one of the signatory states to a port outside the state, or conversely. Ports in colonies are considered to be ports outside of the state. Ports less than 200 miles from the coast may be excepted upon general notification.

(*b*) After inspections with satisfactory results a "safety certificate" was to be issued to ships, but not for longer than 12 months.

(*c*) The provisions as to the subdivision of the hull define the permissible length of compartments for ships of different lengths and for different parts of the hull.

(*d*) The signatory states agree that they will adopt legislation which will insure that the vessels are sufficiently and efficiently manned.

(*e*) The character of the boats and rafts is explicitly defined, giving the requirements in detail. The number of davits depends on the length of the ship. Not more than 25 per cent of the persons permitted to be on board may be transported in rafts or in boats inferior to first-class lifeboats. Tables are given showing, for ships of different lengths, the minimum number of davits and first-class lifeboats and the capacity of the latter. Sufficient boat or raft capacity must be provided for all persons on board.

(*f*) Certificated lifeboat men must be provided for each boat and raft, the number depending upon its size. These men must have been trained in all the operations connected with launching lifeboats and the use of oars, must be acquainted with the practical handling of the boats or rafts and be capable of understanding and answering orders relative to lifeboat service, and they must be given certificates confirming their possession of these qualifications.

(*g*) Musters and drills of the crew at boat and fire stations must be held at least once a fortnight and an entry of the fact made in the ship's log. The muster list must show the duties of each of the crew.

(*h*) The carriage of cargo which, through quantity, character, or method of stowage, is likely to endanger the lives of passengers is forbidden.

(*i*) Emergency lighting from an independent source, placed as high above water as possible, must be provided for the boat deck wherever necessary for purposes of operating the boats, and in passageways.

(*j*) Life jackets must be of approved construction and must not depend on air inflation for their buoyancy. The number must be equal to the entire number of persons on board, and

some shall be fitted for children. They must be readily accessible and their positions plainly indicated so as to be known to the persons concerned. Life buoys must be of approved pattern; at least one-half (not less than six) shall have self-igniting illuminating apparatus.

(*k*) Approved pumps and fire apparatus shall be carried. These include steam jets, portable fluid extinguishers, smoke helmets, safety lamps, etc.

(*l*) Two vessels are to be provided for the destruction of derelicts, observation of ice conditions, and service as ice patrol. The expense is to be borne by the signatory states in amounts proportioned to percentages given in a fixed table, the United States being invited to undertake the work under this arrangement.

(*m*) The regulations concerning radio (wireless) telegraphy on passenger ships are numerous. They define the kind of service and duration of watch and provide a special code for signals which are used for safety of navigation, etc.

In addition to its formal convention and regulations the conference made other recommendations for safety of navigation, including a revision of the Rules of the Road (q.v.). Many excellent principles followed only in the best ships were approved by the conference and made mandatory, and a decided step towards safety at sea was taken by it.

The attempt to provide rules for freight and coasting steamers naturally failed. Their widely different characteristics would entail much study and long consideration to avoid rules which might be unnecessarily hurtful to certain interests—those of steamship owners, of seaborne trade, and of the public in general. The regulation of conditions on such craft is left to the individual states, their local authorities, and to marine-insurance societies.

The question of stability (see SHIPBUILDING) was not touched upon by the conference, because it would have involved endless controversy. Nevertheless means to retain adequate stability of the vessel after serious injury to the hull is the most important factor in securing safety at sea.

In connection with this subject it may be said that a study of recent accidents like those to the *Titanic*, the *Empress of Ireland*, the *Monroe*, and the *Storstad* shows that transverse bulkheads alone will not preserve a ship. It is further evident that fore-and-aft bulkheads may be dangerous. Certain ships are fitted with central fore-and-aft bulkheads dividing engine and boiler rooms. Such a bulkhead is a deadly menace to a ship with small stability, unless the compartment divided is beyond the broad midship body. It is only of use when quite close to the side, and even then in vessels of small stability it is better to connect it by means of the double bottom to a similar compartment on the opposite side. Such connections, indeed, may be the surest guaranty of safety if associated with adequate transverse bulkheads without doors or with doors which are not left open or can with certainty be instantly closed.

It is the opinion of leading naval architects and seamen that, while it is desirable to have a full supply of boats of the best character that are arranged for easy launching, the greatest gains in safety are to be sought in improvement of the plans of the vessel itself.

The reason why ships are not safer as regards stability is due to a demand by the traveling public for ships which do not roll unpleasantly in a heavy sea—just what a very safe ship with large stability will do. Therefore owners call for such moderate stability as is consistent with safety in any kind of weather and designers build such ships. Many popular vessels—popular because of their easy motion in a seaway—possess very little stability unless they have much heavy cargo in their holds or water in their lower ballast tanks. They are perfectly safe in their intact condition; but if a large hole be opened in the side through collision or other accident, many of them would meet the fate of the *Empress of Ireland*. Consult *International Conference on Safety of Life at Sea* (Washington, 1914). See SHIPWRECK.

SAFETY ENGINEERING. The term is used to designate those devices and methods employed in manufacturing, transportation, and mining which have as their object the prevention of injuries and loss of life to employees and the public. It is bound up with the widespread movement towards accident prevention which takes as its slogan "Safety first." The motives behind this movement are several: in part a desire to mitigate the appalling casualty rate in American industries, in part a humanitarian impulse growing out of the older welfare work for laborers, and lastly, most potent of all, an effort on the part of employers to lessen the expense of insurance and direct payments necessitated by the workmen's compensation acts in the various States.

On the voluntary side the safety movement began in many isolated plants, and then gradually coalesced in larger and larger organizations. In 1915 the most important single group was embodied in the National Council for Industrial Safety, which had recently absorbed the American Mine Safety Association and the Railroad Safety Association. Its membership included the representatives of 1450 large industrial concerns in the United States, officials of insurance companies, and State and Federal officials. It holds an annual safety congress, the fourth of which met in Philadelphia October, 1915. This council has adopted as the universal danger sign the red ball, which it hopes to make as significant as the Red Cross.

Another safety organization, second in importance only to the National Council, is the Committee for Accident Prevention and Workmen's Compensation of the National Association of Manufacturers. This distributes information to individual corporations, conducts a campaign of education by means of lectures, moving pictures, and bulletins, and in general carries on activities similar to those of the National Council.

A permanent American Museum of Public Safety has been established, which keeps on exhibition standard safety devices and holds special annual exhibitions. It is housed in the United Engineering Building, New York City. The museum exchanges information and exhibits with safety museums abroad, for the movement towards accident prevention is an international one. There were in 1915 in the world 22 museums devoted to the conservation of human life, located in Holland, England, Belgium, Sweden, Denmark, Finland, Switzerland, Spain, Russia, France, Austria, Germany, and Canada.

Quite as significant as the voluntary efforts of business men has been the work of State

industrial commissions and State compensation bureaus. These are usually the outgrowth of the older State boards of fire and factory inspectors. They seek to reduce accident and fire hazards and to introduce uniform safety devices throughout the State. It has been the experience of State commissions that while large plants are easily persuaded to install safety devices, considerable pressure must be put on smaller establishments to secure conformity to rules. The work of the Industrial Commission of Wisconsin has attracted more attention than that of any other single State. This commission coöperates as closely as possible with the leading manufacturers within the State and after conferences with them issues general safety orders. These orders cover the chief points of danger, with a mass of detailed instruction. The commission spends much of its effort in the organization of safety committees in factories and in educating the workingmen and the public to the needs of caution and safety methods.

A great deal of emphasis has been placed on the fact that the use of safety devices alone is not sufficient to prevent accidents. The Wisconsin commission says in one of its reports: "We must conclude that the great majority of accidents are not preventable by guards. . . . The guarding of machinery is but one phase of accident prevention. If every danger point on every machine were perfectly guarded, making accidents upon them impossible, then we would have eliminated just about one-fourth of all accidents." This contention is supported by statistics. The Bureau of Labor of the State of Washington made a similar report. It is for this reason that leaders in the "safety first" movement place so much stress on the instruction of workmen and the posting of numerous caution and danger signs.

Safety engineering is related to what has been called efficiency, or social, engineering. As yet it has scarcely touched agriculture (despite the fact that the accident rate in agriculture is quite as high as in other occupations), but confines itself to manufacturing, transportation, and mining. On the technical side safety engineering may be said to have three branches, as follows: (1) safeguards on machinery; (2) safeguards against fire; (3) sanitation.

Obviously the safety engineer, in order to do his work efficiently, must have his say in the construction of a plant and not merely invade it with safety devices after it is finished. In the case of railroads safety engineering provides for properly guarded or elevated crossings, for a nearly indestructible roadbed, and for elaborate switching and signal systems. In the case of mines it provides for adequate timbering and roofing and for proper grading and draining. In the construction of factories, mills, and workshops, safety engineering imposes a number of definite requirements: the building must be of fireproof or fire-resisting materials; must have sufficient fire escapes and clear exits; boilers must be located in a detached or adjoining boiler house; enough floor space must be allowed to prevent crowding of machinery; windows, ventilators, and lamps must be adequate to insure sufficient light and an ample volume of fresh air; proper and ample sanitary facilities must be provided for the employees.

The specific safety devices for dangerous machines are, of course, innumerable and are constantly being modified and increased as new machines and processes are introduced.

Besides the devices placed on or near machines there are many devices worn by workmen, such as the goggles, helmets, and burn-proof boots used in foundries. A safety system in an establishment usually includes a medical department and a first-aid corps. In many plants the employment of the principles of safety engineering has led to a greater solicitude for the welfare of the worker, since long hours, overwork, unsanitary surroundings, or anything else which lowers the vitality of the workman and hinders the maintenance of good health leads to carelessness and lack of alertness, one of the chief causes of accidents.

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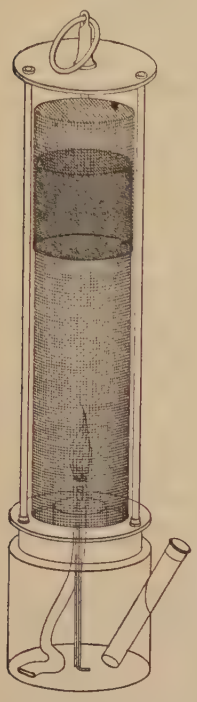
SAFETY CHAIN. See Chain.

SAFETY FIRST. See Safety Engineering.

SAFETY LAMP. A lamp used by miners, the flame of which is protected by wire gauze. The safety lamp is designed both to give light and to detect the presence of inflammable gas without causing the ignition of an inflammable mixture outside the lamp. In the Davy lamp, invented by Sir Humphry Davy (q.v.) in 1815, the cylinder is covered with a close metallic gauze and is protected by three external, strong, upright wires, which meet in a plate or cap at the top, to which a ring is attached for suspending the lamp. The oil is supplied to the interior by a pipe projecting from the cylinder, and the wick is trimmed by a wire bent at the upper end and passed through the bottom of the lamp, so that the gauze need not be removed for this process. When a lighted lamp of this kind is introduced into an explosive mixture of air and fire damp, the flame is seen gradually to enlarge as the proportion of light carbureted hydrogen increases, until at last it fills the entire gauze cylinder. Whenever this pale, enlarged flame is seen the miners should depart to a place of safety, for, although no explosion can occur while the gauze is sound, yet at a high temperature the metal becomes rapidly oxidized and might easily break, and a single aperture of sufficient size would then occasion a destructive explosion. Davy's claim as an original discoverer was immediately challenged by various persons, among them Dr. Reid Clanny, of Newcastle, and the great engineer George Stephenson (q.v.). Clanny's safety lamp was based on the principle of forcing air through water by bellows; but the machine was ponderous and complicated and required a boy to work it. In later forms of the Clanny lamp the bellows was omitted and a glass cylinder was used to surround the flame, while there was a wire gauze cylinder above and in some forms a cylindrical metal cover or bonnet for the gauze. Stephenson's lamp, familiarly called the Geordy lamp, was actually in use at the Killingworth mines. In its general principle it was the same as Davy's, the main difference being that the Stephenson lamp had a glass cylinder besides

the gauze one, to resist strong currents of air, and that glass without gauze is not safe from fracture. In some modern safety lamps the air enters at the top, which usually has a bonnet or surrounding casing of steel or other metal, and passes down through tubes and then a strip of gauze or through two cylinders of gauze before reaching the flame. The most used type consists of a glass cylinder immediately around the flame, and of wire gauze above usually double and conforming in mesh and size of wire to official standards. There may be an internal metal chimney opening a short distance above the flame to create a strong upward draft, which causes the freed air to pass briskly down from the wire gauze and so keeps the glass cool and insures thorough combustion. Safety lamps may be designed to burn either oil, naphtha, or gasoline, the latter being specially used for the detection of gas. Safety lamps in general use are the Mueseler, Marsant, Evan Thomas, Ashworth-Hepplewhite-Gray, and the Wolf, all of which show variations from the fundamental types.



DAVY SAFETY LAMP.

By mechanical arrangements the danger of the safety lamp being converted into an open-flame lamp by any chance or mishap is obviated. Usually there is some device for locking the gauze about the flame after the lamp has been lighted. This is done to prevent by any possibility the naked flame from coming in direct contact with the exterior atmosphere. The presence of fire damp is shown by an elongation of the flame of the lamp and the formation of a luminous cap or blue flame, which increases in size with the amount of gas present in the atmosphere. The miner tests for the gas by turning his flame down to a point where it is practically nonluminous and then noting the size of the cap.

As detectors of fire damp various lamps have been specially devised in addition to the standard types. Usually these burn naphtha, alcohol, hydrogen, or some other substance and give a sensitive flame. The Hughes Bonneted Fire Boss lamp has full gauze as well as a bonnet and glass which can be raised to give outside atmosphere access to the flame. The Pieler lamp, which burns alcohol, is a detector of the simplest arrangement and usually has a scale for reading the height of the gas cap, and as modified by Chesneau burns methyl alcohol containing cuprous chloride, which indicates the gas not only by the cap but by the changed color of the flame. The Clowes gas-testing lamp contains a supply of compressed hydrogen, which is burned at a small jet and is used for testing where the air contains less than 3 per cent of the gas; while in the Hempel gas-testing lamp the hydrogen is generated by chemicals.

While hardly to be considered a safety lamp, there is now widely used in the nongaseous coal mines and many metal mines an open-flame cap lamp burning acetylene gas produced by the action of water on calcium carbide. The use of safety lamps is required in gaseous coal mines, but the carbide lamps are largely displacing the miner's open-flame oil lamp and candles, giving far better light and often revealing dangerous roof conditions to the careful miner. With the observance of proper precautions carbide lamps can be used with considerable advantage.

The use of electricity both for lighting and power is very general in mines, and it is obvious that the incandescent lamp so long as intact is perfectly safe in an atmosphere of any gas, however explosive, and furnishes the best possible illumination. The only danger is due to the ignition of explosive gas mixtures by the glowing filament or a spark after the glass bulb has been broken, or by defects in insulation or wiring. Notwithstanding the increased expense lighting by electricity is often desirable for many kinds of mines, though where the work is not of a permanent nature it is not of course feasible. Portable electric lamps for miners are largely used and for safety and intensity of illumination as well as convenience are superior to open-flame lamps and are recommended by the United States Bureau of Mines. Of course the electric lamp does not serve as a detector of fire damp and in gaseous mines should not be used exclusively.

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SAFETY VALVE. A circular lifting valve placed on an opening in the top of a steam boiler and kept in its place either by weights above it, by a lever of the second order, with a weight capable of sliding along the arm, or by a spring. In stationary boilers one valve is frequently found sufficient, and the pressure on the valve is produced by the first or second of the methods indicated above. In locomotive engines (see LOCOMOTIVE), on the contrary, there are always two valves. Whenever the tension of the steam in the boiler rises above a certain amount (the weight in pounds with which the valve is held down divided by the area in inches of the undersurface as exposed to the steam), the valve is forced upward and, the pressure on the boiler thus relieved, the valve sinks to its place. The only precaution necessary is to be sure that the valves are not too heavily loaded or fastened. The grate surface is now the commonly accepted unit by which to determine the size of the safety valve, so that the pressure due to the application of heat to the water may be released at the safety valve as fast as it is formed, or nearly so. The United States regulations for steam vessels require that lever safety valves shall have an area of not less than 1 square inch to 2 square feet of grate surface in the boiler, and

this proportion also obtains in good stationary-boiler practice.

SAFFI, säf'fē. A seaport of Morocco. See SAFI.

SAFFLOWER, săf'lou'ēr (OF. *saflor, safleur*, from Olt. *saffiore, asfiore*, from Ar. *usfūr*, safflower, from *safrā'*, yellow, influenced by popular etymology with Eng. *flower*), *Carthamus tinctorius*. A branching annual plant of the family Compositæ, 2 or 4 feet high, with dark orange or vermilion flowers. It is a native of India, whence it probably spread to Egypt and the Levant, where it became naturalized. It is extensively cultivated in southern Europe, especially France, and in some parts of South America, for its corollas, which are picked by hand in dry weather, dried in a kiln, and formed into small, round cakes used as yellow and red dyes. The safflower of Persia is generally esteemed the best. Safflower is sometimes called bastard saffron and is used to adulterate saffron. The yellow coloring matter is valueless as a dyestuff, and since the red (carthamic acid or carthamine) fades with light and age, it is not so popular as formerly. Rouge derives its color from safflower. The seed of the safflower contains an oil that is sometimes expressed for use. See also ROUGE.

SAFFORD, TRUMAN HENRY (1836–1901). An American astronomer, born in Vermont and educated at Harvard. In 1863 he was made assistant observer at the Cambridge Observatory and in 1865 became director of that at Chicago. He was professor of astronomy at Williams College (1876–99) and built a meridian observatory there. He published a star catalogue and a catalogue of right ascensions of close polar stars. Safford also predicted the position of the companion of Sirius (q.v.).

SAFFRON (*Crocus sativus*).

SAF'FRON (OF. *safran, safran*, Fr. *safran*, It. *zafferans*, Sp. *azafran*, from Ar. *asfarān*, saffron, from *safra'*, yellow). A bright-yellow flavoring and coloring material, consisting of the dried stigmas of the common yellow crocus (*Crocus sativus*), the bulbs of which were introduced into Europe from Asia Minor. They are largely cultivated in Spain. Saffron is often employed as a perfume, but its chief uses are as a diaphoretic in eruptive diseases of children and for flavoring and coloring confectionery and culinary articles. Its great solubility in water prevents its use as a dye for fabrics. (See CROCUS.) American or false saffron is obtained from the florets of *Carthamus tinctorius*.

SAFFRON WOOD. A South African timber tree. See ELÆODENDRON.

SAFI, sä'fē, or **SAFFI** (Ar. *Asfi*, or *Asaffi*). A seaport on the northwest coast of Morocco, 102 miles west-northwest of the city of that name (Map: Africa, D 1). It was at one time the chief seat of the trade with Europe and, though it has declined with the rise of Mogador, it still has considerable export trade, chiefly in leather, horses, and grain. The total volume of trade in 1913–14 amounted to $4,567,000. Pop., about 18,500.

SAFONOV, sä-fō'nôf, VASSILY ILJITSCH (1852–1918). A Russian conductor and pianist. He began the study of music with private teachers and in 1878–80 was a pupil of the St. Petersburg Conservatory. From 1880 to 1885 he taught at this institution, and then accepted a professorship at the Moscow Conservatory, of which he became director in 1889. From 1890 to 1905 he conducted the symphony concerts of the Imperial Russian Music Society. He appeared as guest conductor in the principal cities of Europe. In 1905 the Philharmonic Society of New York engaged him for two of its concerts and in 1906 he accepted the conductorship of the society for three seasons. At the same time he served as director of the National Conservatory in New York. Subsequently he returned to Moscow, appearing frequently as guest conductor in the principal European cities, especially London.

SAF'RANIN. See COAL-TAR COLORS.

SAFTLEVEN, säft'lā'ven, **SAFTLEBEN**, säft'lā'ben, or **ZACHTLEVEN**, zäkt'lā'ven, CORNELIS (c.1607–81). A Dutch landscape and portrait painter and etcher, born in Gorkum. He studied under his father, Herman Saftleven the Elder, but was chiefly influenced by Brouwer. He painted guardrooms, rural interiors, and landscapes with figures and cattle, with a fine brush and in a conventional but pleasing manner. Characteristic specimens may be seen in the Dresden Gallery, the Louvre, and the galleries of Amsterdam, Cologne, Karlsruhe, Brunswick, Vienna, and St. Petersburg. His etchings are held in great esteem.

HERMAN (1609–85), a brother of Cornelis, was a landscape painter and etcher. In 1633 he went to Utrecht, where he became head of the painters' guild. The Dresden Gallery possesses 17 of his pictures on a small scale, executed with minute delicacy. His etchings are about 38 in number (1640–69).

SAGA, sä'gä. The capital of the prefecture of the same name in Japan, situated in the northwestern part of the island of Kiushu, 82 miles by rail northeast of Nagasaki (Map: Japan, B 7). It was formerly the residence of the lords of Hizen, whose beautiful park is a feature of the town. Pop., 1898, 32,753; 1908, 36,051.

SAGA (Icel., tale, story, history). The name applied to the most important division of Icelandic prose literature. It was developed in Iceland alone. Possibly Iceland's intercourse with the Irish, who even before the eleventh century had a prose literature, may have had an influence in the production of this literary form. At the annual gathering at the Thing in Iceland in midsummer old sagas were told and material for new ones was gathered. At first the sagas were merely told by Sagnamenn and kept alive in the hearts and minds of each succeeding generation until they were written down, some in the twelfth century, but the majority in the thirteenth. The written saga has used

the oral saga only as a background, inasmuch as it has borrowed certain definite data and genealogies, but the author of the written saga has been original in language, in characterization, and in dramatic arrangement. The saga has its fixed laws and set phrases, and certain restrictions are as clearly adhered to as in verse. The simplest form of saga was the þáttr and the frásogn or frásaga, the former of which was mainly some stirring deed or episode out of the life of a great Icelander and the latter a simple narrative.

The sagas are divided into several groups: (1) historical sagas; (2) mythical or heroic sagas; (3) romantic sagas. Historical sagas are subdivided into *Islendingasögur* and *Konungasögur*. The *Islendingasögur* had as their theme the life of some noted Icelander. They frequently began with his ancestry, traced it down through him and sometimes his descendants, recounted his life, his struggles, his travels, his loves and his hates, and frequently, after his death, the vengeance that was wreaked upon his enemies by his kinsmen. They are stirring accounts, vivid and forceful, and by the introduction of dialogue have intense dramatic vigor. The events recorded occur mostly between the years 874–1030 and they convey to us a fair and faithful picture of life in Iceland during those centuries. Several sagas are sometimes grouped together, as the *Egilssaga* and *Gunnlaugssaga*, the *Hrafnkelssaga* and *Droplaugarsonasaga*. Some show evidence of several sagas combined, as in the *Njálssaga*, which comprise both the *Gunnarssaga* and the *Njálssaga*.

The *Konungasögur* contain the lives of the kings, mainly of Norway; the most important is the *Heimskringla*, by Snorri Sturluson (q.v.) (ed. by Vigfusson, Oxford, 1887; F. Jónsson, 4 vols., Copenhagen, 1893–1901; G. Storm, 2 vols., Christiania, 1896–99; Eng. trans. by S. Laing, 4 vols., 2d ed., London, 1889; Morris and Magnússon, 2 vols., ib., 1893–94; Bjarnsson, Reykjavík, 2 vols., 1908–09). It contains among other well-known sagas the *Olafs saga Tryggvasonar*. Historical sagas rarely contain any personal views of the author, and they attained under Snorri, about 1230, their greatest height. Some of the sagas of the classical period are literary and æsthetic works of art.

The mythical or heroic sagas are quite different in form and speech from the historical. Some legend or hero is the central figure of the saga, and fact and fancy are mingled freely together. The most striking example of this type is the *Völsungasaga* (q.v.) (ed. by Ranisch, Berlin, 1908, and Olsen, Copenhagen, 1906–08), which is a prose rendition of the Nibelungen story as it is given in the Eddic lays. See Edda.

The romantic sagas are mainly adaptations or imitations of Latin, French, or German themes, and were not reduced to writing before the middle of the thirteenth century. There were sagas dealing with Alexander, Charlemagne, Perceval, Tristan, etc.

The *Islendingasögur* may be divided according to the different geographical districts of Iceland. As a rule the best sagas come from the West. Here are found, among others, the *Egilssaga* (ed. by Asmundarson, Reykjavík, 1910; trans. by Green, London, 1893); the *Eyrbyggjasaga* (ed. by Gering in *Altnordische Saga Bibliothek*, Halle, 1897; trans. by Morris and Magnússon in *The Saga Library*, vol. ii, London, 1892); and the *Laxdœlasaga* (ed. by Kaalund, Copenhagen, 1889–91, and Halle, 1896; trans. by Press, London, 1906). The last named is a saga of romance and is the foundation for William Morris's "Lovers of Gudrun." The *Gunnlaugssaga*, a continuation of the *Egilssaga*, is the most beautiful yet tragic Icelandic love story (ed. by Mogk, Halle, 1908, and Asmundarson, Reykjavík, 1911; trans. by Morris and Magnússon, in *Three Northern Love Stories*, London, 1901). To the North belong the following: *Kormákssaga* (ed. by Asmundarson, Reykjavík, 1893), *Reykdœlasaga* (ed. by Asmundarson, Reykjavík, 1896), *Svarfdœlasaga* (ed. by the same scholar, ib., 1898), *Viga Glumssaga* (ed. by the same scholar, ib., 1897, and in *Origines Islandicæ*, vol. ii, 1905; trans. by Sir Edmund Head, London, 1866), *Grettissaga* (ed. by Boer, Halle, 1900; by Asmundarson, Reykjavík, 1900; trans. by Magnússon and Morris, London, 1900). This is the story of the most famous of Icelandic outlaws.

To the East belong the *Vápnfirdhingasaga*, the best saga from this district (ed. by Asmundarson, Reykjavík, 1898). We have also the *þorsteinssaga hvíta* (ed. by Asmundarson, Reykjavík, 1902), the *Hrafnkelssaga*, a purely idyllic saga (ed. by Asmundarson, Reykjavík, 1911), and the *Droplaugarsonasaga* (ed. by Jónsson, Reykjavík, 1878).

In the South is found the *Njálssaga* (ed. by Asmundarson, Reykjavík, 1894; Finnur Jónsson in *Altnordische Saga Bibliothek*, Halle, 1908; trans. by Dasent, New York, 1912). This is the foremost of all sagas, full of intrigue and cunning, of hate and love, with remarkable characterization.

Sagas relating to Greenland and America are the *Eirikssaga raudha*, *Fostbrœdhrasaga*, *Grœnlendiga þáttr* in the *Flatey-bók* (all ed. by Rafn in *Antiquitates Americanæ*, Copenhagen, 1837, and by Reeves, *The Finding of Wineland the Good*, London, 1890; new enlarged ed., ib., 1895).

The *Sturlúngasaga* occupies a position different from the sagas mentioned above, because we can here trace authorship to Sturla Thordsson (1214–84) (ed. with elaborate introduction by Vigfusson, Oxford, 1878, and by Bjarnason, Reykjavík, 2 vols., 1908–09).

Historical sagas referring to other countries are the *Knytlingasaga*, giving a history of the Danish kings, and the *Orkneyingasaga* or *Jarlasaga*, giving a history of the earls of Orkney.

The *Flateyarbók* (ed. by Unger and Vigfusson, Christiania, 1860–68) contains many þættir. The most notable are *Ogmund dytt* and *Thorstein Oxfot*.

In addition we have the *Skröksögur*, or spurious sagas, which show the rapid decline of the saga in the fourteenth century.

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Icelandic (London, 1908); G. Vigfusson, "Prolegomina," in *Stulunga Saga* (new ed., 2 vols., Oxford, 1912); W. N. O. Carlton, *Icelandic Sagas: Their Origin and Character* (Chicago, 1912); W. A. Craigie, *Icelandic Sagas* (New York, 1913); also Halldór Hermannsson, *Bibliography of the Icelandic Sagas and Minor Tales* (Ithaca, 1908); id., *Bibliography of the Sagas of the Kings of Norway* (ib., 1910); id., *Bibliography of the Mythical-Heroic Sagas* (ib., 1912).

SAGAING, sä'gä-ēng'. A division of Upper Burma, British India, comprising the districts of Upper and Lower Chindwin, Sagaing, and Shweb (Map: Burma, C 2). Area, 30,038 square miles. Pop., 1901, 999,168; 1911, 1,005,784.

SAGAN, zä'gän. The capital of the mediatized Principality of Sagan, in the Province of Silesia, Prussia, on the Bober, 82 miles northwest of Breslau (Map: Germany, F 3). It has a castle with a beautiful park, a Gymnasium, and a normal school. Its manufactures include cotton and woolen cloths, pottery, porcelain, glass, and paper. Pop., 1900, 13,367; 1910, 15,100.

SAG'APE'NUM. See GUMS.

SAGAR, sä'gar. An island of Bengal, India. See SAUGOR.

SAGAR, sä'gar, **SAUGUR**, są'gŭr, or **SAUGOR**, są'gōr'. The capital of a district of the same name in the Central Provinces, India, 47 miles southeast of Bina by rail, on the Sagar Lake (Map: India, D 4). It is regularly laid out and has broad streets. The most striking feature is the fort on an elevated site overlooking the town; it covers an area of 6 acres and is surmounted by several towers. The military cantonment lies to the northeast of the city. Agriculture and the breeding of cattle and buffaloes are the leading industries of the surrounding section. Pop., 1911, including cantonment, 43,245.

SAGASTA, sä-gäs'tä, PRAXEDES MATEO (1827–1903). A Spanish statesman, born at Torrecilla de Cameros. After following the profession of engineer he was elected to the Cortes of 1854 from Zamora. His share in the uprising of July, 1856, forced him to flee to France, whence he returned, after being amnestied, to take a position in the faculty of the school of engineering at Madrid and to assume the editorship of the Progressist organ, *La Iberia*. From 1859 to 1863 he sat in the Cortes and, as a stanch Liberal, participated in the struggle against the reactionary government of Isabella II. After the rising of June 22, 1866, Sagasta again fled to France. Upon the outbreak of the revolution of September, 1868, Sagasta became Minister of the Interior in the provisional government, attaching himself to Prim. He became President of the Cortes in October, 1871, assumed the portfolio of the Interior in December, and from February to May, 1872, was head of the ministry. He took office as Minister of Foreign Affairs under Serrano (q.v.) in January, 1874, and, after the latter made himself virtual head of the government in the following month, became Minister of the Interior and subsequently Premier. Upon the election of Alfonso XII to the Spanish throne Sagasta resigned (December, 1874). In the following year, however, he appeared as the leader of those Liberals in the Cortes who rallied to the support of the new throne and, upon the fall of Cánovas del Castillo, in 1881, was intrusted with the formation of a cabinet. He remained in power till 1883, but failed to carry out any of the sweeping reforms advocated by the Liberal party. After the death of Alfonso XII he once more became Premier and remained in power till 1890, signalizing his term of office by firmly repressing all attempts on the part of the military element to renew the anarchy of the years following the dethronement of Isabella II. The weakness of the Conservative party afforded Sagasta another period of office from December, 1892, to March, 1895, his resignation being due to his inability to cope with the military situation in Cuba, where a new insurrection had broken out. In September, 1897, he was called to the head of affairs at a time when matters in Cuba were hastening to a crisis. The disastrous war with the United States, which all his efforts could not prevent, led to his resignation in March, 1899. For the last time he assumed office in March, 1901. He resigned in December, 1902, after the young Alfonso XIII had attained his majority.

SAGE (OF., Fr. *sauge*, from Lat. *salvia*, sage plant, from *salvus*, safe, Gk. ὅλος, *holos*, whole), *Salvia officinalis*. A perennial garden herb used to flavor dressings, sauces, etc. It is a half-shrubby plant which grows on sunny mountain slopes in southern Europe and has long been in cultivation. The whole plant has a peculiar, strong, penetrating, aromatic smell and a bitterish, aromatic, somewhat astringent taste. It contains much essential oil (oil of sage). Sage grows best in a dry soil and is easily propagated by slips or cuttings. Meadow clary, or meadow sage (*Salvia sclarea*), is a common ornament of meadows and borders of fields in most parts of Europe and has become established in parts of the United States. In the Western States the name "sage" is applied to various species of *Artemisia* (q.v.).

SAGE, HENRY WILLIAMS (1814–97). An American philanthropist. He was born at Middletown, Conn., studied medicine for a while, and in 1832 entered upon a mercantile career. He was elected a member of the New York Legislature in 1847. Sage succeeded to the business of two of his uncles in Ithaca, N. Y. In 1857 he removed to Brooklyn, where he lived until 1880. After the death of Ezra Cornell in 1874 he was elected president of the board of trustees of Cornell University (q.v.). Besides the women's department main building, Sage College, and a chapel which bear his name, he gave Cornell a new library building with an endowment.

SAGE, MARGARET OLIVIA SLOCUM (MRS. RUSSELL SAGE) (1828–1918). An American philanthropist. She was born in Syracuse, N. Y., and graduated from the Troy Female Seminary (later called the Emma Willard School) in 1847. After the death of her husband (q.v.) she began to dispose of the large fortune left by him. Her greatest single benefaction was the gift of $10,000,000 in 1907 to establish the Russell Sage Foundation (q.v.). Three years later she gave $2,750,000 for the development of the Russell Sage Foundation Homes, a suburban community at Forest Hills Gardens, Long Island. Up to 1915 the sum total of Mrs. Sage's gifts amounted to more than $23,000,000. Among the more notable, besides those already mentioned, were: $1,000,000 to the Emma Willard School; more than $1,000,000 to Rensselaer Polytechnic Institute (Troy); $800,000 to Cornell University; $350,000 to Princeton; $250,000 to Berea

College; $350,000 to the Y. M. C. A., New York; $500,000 to the Methodist Episcopal Church, for Bible extension; and $300,000 to the Sage Institute of Pathology (City Hospital, Blackwell's Island, New York). In 1912 Mrs. Sage acquired Marsh Island in the Gulf of Mexico and dedicated it as a home for wild birds.

SAGE, Russell (1816–1906). An American capitalist, born at Shenandoah, Oneida Co., N. Y. He had a public-school education and for several years was an errand boy and clerk in grocery stores. In 1837 he gained an interest in a retail grocery business in Troy and from 1839 to 1857 was connected with a similar wholesale firm. From 1841 to 1848 he was an alderman in Troy and from 1845 to 1849 county treasurer. While a Whig member of Congress (1853–56) he served on the Ways and Means Committee. Nine years after his removal to New York Sage bought a seat on the Stock Exchange (1874) and thenceforth was known as a financier, closely associated with Jay Gould (q.v.) in the control of the Wabash, the St. Louis and Pacific, the Missouri Pacific, and other western railroads, and prominent in the Western Union Telegraph Company and the Manhattan Elevated Railroad System (New York City). Especially did his railroad operations in Wisconsin, and most of all in connection with the La Crosse and Milwaukee, bring him notoriety. For a full but rather hostile account of Sage's rise in the financial world, consult Gustavus Myers, *History of the Great American Fortunes,* vol. iii (Chicago, 1910). In 1891 a dynamite bomb was exploded in Sage's office by a man who had demanded and been refused a large sum of money; the fanatic and Sage's secretary were killed. Upon her husband's death, July 22, 1906, Mrs. Russell Sage (Margaret Olivia Slocum Sage, q.v.) received unconditionally a fortune estimated at more than $50,000,000, to be used as she saw fit. See also Russell Sage Foundation.

SAGE'BRUSH'. See Artemisia.

SAGEBRUSH STATE. Nevada. See States, Popular Names of.

SAGE COCK. See Grouse.

SAGE FOUNDATION. See Russell Sage Foundation.

SAGE GROUSE. The largest of American grouse (*Centrocercus urophasianus*), which inhabits the sagebrush plains of western North America and the mountain valleys up to about 9500 feet. The full-grown cocks average about 2½ feet in length; the hens rather under 2 feet; the weight varies from three to six pounds. A remarkable feature of the cock is the immense dilatable air sac of naked yellow skin on each side of the neck, bordered by a patch of curiously stiffened, horny feathers, like fish scales, often terminating in bristly filaments several inches long. The feet are feathered to the toes. The upper parts are varied with gray, black, brown, and tawny or whitish, and a noticeable mark is a broad black area on the under part of the adult. It is numerous in its habitat and affords good sport with dogs, but its flesh is so tainted with the bitterness of the artemisia buds upon which it principally feeds (unless drawn as soon as shot) as to be undesirable for the table. It also eats many insects, especially locusts. It nests on the ground and lays elongated, heavily spotted eggs. Consult Elliott Coues, *Birds of the Northwest* (Washington, 1874). See Grouse.

SAGE HARE. A jack rabbit. See Hare.

SAGE OF THE GRAND ARMY. See Drouat, Antoine.

SAGES, The Seven. See Seven Sages, The.

SAGE SPARROW. One of the pale-colored desert sparrows of the genus *Amphispiza,* related to the song sparrow and inhabiting the sagebrush district of the western United States.

SAGE THRASHER. See Mocking Bird.

SAGHALIEN. See Sakhalin.

SAG HAR'BOR. A village in Suffolk Co., N. Y., 100 miles east of New York on Shelter Island Sound, an arm of Gardiners Bay, and on the Long Island Railroad (Map: New York, C 2). It was formerly one of the most important whaling centres in America, but at present is best known as a summer resort. It contains the Sacred Heart of Mary Academy, a park, public library, a high school, and a proving station for testing torpedoes sold to the government. The leading industries of the village are the manufacture of watch cases, art goods, and silver and aluminium ware. Pop., 1910, 3408; 1915 (State census), 2099.

SAGINAW, săg'ĭ-nạ. The county seat of Saginaw Co., Mich., and a commercial centre, 99 miles by rail northwest of Detroit, on the Saginaw River, at the head of deep-water navigation, and on the Grand Trunk, the Michigan Central, and Pere Marquette railroads (Map: Michigan, F 5). It is on both sides of the river, which is spanned by four railroads and seven public bridges. The city covers 16 square miles and is paved extensively with asphalt and brick. Several large and beautiful parks add to the attractiveness of the city, of which Hoyt, Bliss, Jeffers, Linton, and Ezra Rust are noteworthy. The Hoyt Library with 35,000 volumes, the Public Library, the Michigan Institute for the Blind, and Mershon-Whittier Natatorium, the Old Folk's Home, and the Germania Institute are also prominent features. A free manual-training school, the gift of Hon. W. R. Burt, dates from 1903. A fine trade school, the gift of Hon. Arthur Hill, equipped with a United States Weather Bureau station, occupies an entire block in a picturesque location. Among other handsome edifices are the Auditorium, three Masonic temples, the Court House, City Hall, St. Mary's, Saginaw General, Woman's, and Detention hospitals, Elks Temple, Y. M. C. A., three good clubs, Y. W. C. A., and the post-office building. The charitable institutions include Home for the Friendless and St. Vincent's Orphan Home.

Saginaw was long known as one of the greatest lumber and salt manufacturing centres in the country. The disappearance of pine forests, however, has necessarily led to the abandonment of its saw mills, though there are still large firms engaged in the manufacture of rough and dressed lumber, sash, doors, and boxes. With the passing of the lumber industry came the discovery of great beds of bituminous coal. More than 2,000,000 tons were mined in 1914. A productive beet-sugar district surrounds the city. In the census year 1909 the capital invested in the various manufacturing industries was $26,703,000 and the total output was valued at $18,833,000. Among the leading establishments are the glass works with a yearly capacity of 1,000,000 square feet, an immense bean elevator, and very large beet-sugar factories. Besides lumber, glass, salt, and beet sugar, there is a great variety of manufactured products. An important trade is carried on through the city's

wholesale houses, some of which are among the largest in the country.

Saginaw spent in 1913 for maintenance and operation $709,000, the chief items of expenditure being $275,000 for education, $122,000 for highways, $55,000 for police department, $53,000 for fire department, $34,000 for sanitation, and $40,000 for the water-supply system. Saginaw was created in 1890 by the consolidation of Saginaw City and East Saginaw. It was first settled in 1822. Saginaw received a city charter in 1857. The commission form of government was adopted in 1914. Here, on Sept. 24, 1819, Gen. Lewis Cass (q.v.) concluded with the Indians the Treaty of Saginaw, which ceded vast tracts of lands to the United States. Pop., 1900, 42,345; 1910, 50,510; 1915, 54,815; 1920, 61,903.

SAGINAW BAY. An arm of Lake Huron, about 60 miles long and 20 miles wide, extending southwestward into the State of Michigan (Map: Michigan, F 5). It receives the Saginaw River (q.v.).

SAGINAW RIVER. A river of Michigan, formed by the confluence at Saginaw of the Tittabawassee from the north, the Shiawassee from the south, and the Cass from the east (Map: Michigan, F 5). The main stream is only 20 miles long and empties into Saginaw Bay. It is navigable for small boats throughout its length.

SAGITTARIUS, săj'ĭ-tā'rĭ-ŭs (Lat., the archer). The ninth sign of the zodiac (q.v.), through which the sun passes during the latter part of November and the early part of December. It is represented by the conventional symbol ♐. The constellation Sagittarius contains no stars brighter than the third magnitude, but has several fine short-period variables. Several *novæ* are recorded as having appeared in this constellation, one as early as 386.

SAGITTARIUS, zä'gĭ-tä'rĭ-ụs. See SCHÜTZ, HEINRICH.

SA'GO (from Malay *sāgū, sāgu,* sago). A starch prepared from the pith of several species of palms (*Mytroxylon, Borassus, Arenga,* etc.), natives of the East Indies, also from several cycadaceous plants. The pith constitutes a large proportion of the trunk and contains a considerable quantity of starch, which is elaborated by the plant as a reserve material. The tree must be cut down after blossoming, otherwise it is useless for the production of sago, as the starch is used by the tree for the growth and development of the seed. The pith, sometimes as much as 700 pounds from a single tree, is pounded in wooden mortars, the starch removed by washing with water and purified by sieving in the usual way. (See STARCH.) The finely divided sago (sago flour) is worked into a dough by kneading and forced through sieves upon hot greased pans to form pearl sago. The dough forms granules, which become covered with a paste made from some of the starch by the action of heat. The finished product consists of translucent globes. Sago has the following percentage composition: water, 12.2; protein, 9.0; fat, 0.4; nitrogen-free extract (chiefly starch), 78.1; ash, 0.3. It is an important article of diet with the natives of the East Indies and is largely exported to Europe and America for thickening soups, making puddings, etc. A peculiarity of pearl sago is that the grains swell and become still more translucent on cooking, but do not form a homogeneous paste. Imitation sago is made from potato starch and other starches. Sago is very similar in its uses to arrowroot, tapioca, and cornstarch, the latter being more generally used in the United States than the others. Imports into the United States amount to about 12,000,000 lbs. annually, valued at $225,000. See Plate of PALMS.

SAGRA, sä'grä, RAMÓN DE LA (1798–1871). A Spanish botanist, economist, and historian, born at Coruña. From 1820 until 1834 he was director of the botanical garden at Havana, Cuba, and professor of botany in the university of that city. Upon returning to Madrid (1835) he devoted himself to economics and to editing two reviews, *Guía del comercio* and *Revista de intereses materiales y morales.* He was elected a corresponding member of the Paris Académie des Sciences and in 1856 was sent to the Cortes as a deputy. Among his numerous works are: *Historia económica, política, y estadística de la isla de Cuba* (1831) and *Historia física, política, y natural de la isla de Cuba* (2 vols., 1837–42).

SAGUA LA GRANDE, sä'gwä lä grän'dā. A town in the Province of Santa Clara, Cuba, on the Sagua River, 5 miles from the north coast and 30 miles north of Santa Clara (Map: Cuba, F 4). It is well built and has machine shops and lumber yards. The main article of export is sugar. Pop., 1899, 12,728; 1907, 12,393, mostly whites, with a considerable number of Chinese. Sagua was founded in 1817.

SAGUENAY (săg'*e*-nā') **RIVER.** A large tributary of the St. Lawrence River, falling into the estuary, on the north side, about 115 miles below Quebec (Map: Quebec, J 3). It is the outlet of Lake St. John, though its name is sometimes extended to the Chamouchouan, the main feeder of the lake, rising 150 miles to the northwest of it. The length of the Saguenay below the lake is about 130 miles. It leaves the lake in a series of rapids, and for the first 36 miles is a narrow stream running between densely wooded hills. At Chicoutimi, the head of navigation, it widens, but the waters are shallow. From Ha Ha Bay, a few miles below, it flows in a fiord valley between walls rising to a sheer height of 1000 to 1800 feet and broken here and there by deep, wooded, but gloomy cross valleys. The water in this fiord has a mean depth in mid-channel of 800 feet, and in some places the depth exceeds 2000 feet.

SAGUNTO, sä-gōōn'tō. See SAGUNTUM.

SAGUN'TUM (Lat., from Gk. Ζάκανθος, *Zakanthos*). An ancient town in the modern Province of Valencia, about midway between the mouth of the Ebro and New Carthage (Carthagena). Later tradition attributed its foundation to Greeks from Zacynthus and Rutulians (see RUTULI) from Ardea. In reality it was an Iberian city, with an admixture of Greek culture due to its commerce. It owes its historical importance to its connection with the outbreak of the Second Punic War. The town had been received into alliance by the Romans, apparently after the treaty of 226 B.C., which bound the Carthaginians not to cross the Ebro. Hannibal, who saw that war must come, attacked the city, which had refused to acknowledge the Carthaginian supremacy, in 219 B.C., and after eight months captured it. The Romans thereupon demanded the surrender of Hannibal for attacking their ally and, upon the refusal of the Carthaginians, declared war. The ruined town was subsequently rebuilt by Scipio Africanus, and appears as a *municipium* under Augustus. The ancient walls (*muri veteres*)

gave rise to the name of the modern town of Sagunto (Murviedro). Pop., 1900, 6784; 1910, 9057.

SAHARA, sȧ-hä′rȧ (Ar. *sāhira*, desert), The. The largest continuous desert on the earth's surface and a part of the arid region which extends from the Atlantic to the Sudan frontier. The name is generally applied to all of northern Africa between the Atlas Mountains and the Sudan, embracing an area of over 3,500,000 square miles, being nearly as large as the European mainland (Map: Africa, D, E 2). The discovery of fossils and limestone deposits of Cretaceous and Tertiary times extending over a wide area of the southwestern part of the Sahara led Professor de Lapparent to the conclusion that the Tertiary sea must have extended inland at least as far east as Lake Chad. He mentions other facts also that point to an unbroken sea communication between India and the central Sahara by way of Egypt in Cretaceous and Tertiary times.

The surface of the Sahara is not, as was once supposed, merely a monotonous and comparatively level waste of sand. Its surface presents, on the contrary, considerable variety of aspect which makes it possible to divide it into five natural groups: (1) the western Sahara, (2) the mountain lands of the central Sahara, (3) the Libyan waste, (4) the Nile lands, and (5) the mountain zone east of the Nile. As a whole the Sahara is a table-land whose surface has an average elevation of 1300 to 1600 feet above the sea, with only limited areas falling to 500 or 600 feet and a few small depressions below the sea level. Thus, propositions to convert the Sahara into an inland sea are not based on an adequate knowledge of the altitudes of this desert area but presuppose it to be below sea level.

The Libyan waste, excepting its depressed oases, is almost purely a sand desert. This sand waste, waterless, barren, almost devoid of life, with sand dunes often piled up by the wind to heights of 300 and 400 feet, is very difficult to cross because of the limited number of oases and thus it has been characterized by Rohlfs as the most treacherous and tediously monotonous region of the Sahara. The most northern of its depressions beneath the sea level are the salt lakes or marshes (shotts) in the southern part of Tunis. They contain scarcely any water and are 50 to 90 feet below the level of the Mediterranean. This is now a region of date palms nourished by the springs which gush from the neighboring hills. In the eastern part of the Libyan desert is a series of deeply depressed oases sharply defined by the precipitous walls of the plateau—Aradj, 230; Siva, 98; Sittra, 82; Uttiah, 66; and the Birket el Kerun, in the Egyptian Fayum, near the Nile, 131 feet below sea level. These are the only depressions, except one, beneath sea level in Africa. A strip of lowland stretches from the shotts of Tunis to the Nile.

About two-thirds of the western Sahara is composed of sterile, rock-strewn plains and the remainder is sand waste, the plains or steppes extending across the desert from northeast to southwest, the sand desert being interspersed among them. A strip of considerable breadth extending along the Atlantic from the Senegal River to Morocco forms a lowland, less than 650 feet in elevation. There are many deep valleys, the beds of streams flowing from the Atlas ranges or from the west slopes of the highlands of the central Sahara, some of the northern wadies or rivers carrying at times considerable water a short distance into the desert; but the water in most of the basins sinks through the permeable strata to an impermeable one of clay, forming vast subterranean reservoirs needing only to be tapped to spread life and wealth over the surrounding surface. The oases are situated where this water reaches the surface as a spring. The soil of the Sahara contains all the elements of fertility except moisture. The Nile, which crosses the desert, adds this element to a small strip of land, and rich crops are reaped. So wherever water can be obtained tracts of wonderful fertility result. The most remarkable of these tracts is El Erg, whose wells are capable of irrigating as many as 8,000,000 date palms. The oases embrace only about 80,000 square miles, or only a little more than one-fortieth of the desert area. The lines of wells that make a number of caravan routes across the western Sahara possible are found along the courses of these subterranean water supplies. The valleys show that at an earlier period the climatic conditions permitted far larger volumes of water to flow on the surface, and evaporation has produced numerous salt pans, particularly in the west and south.

Between the Libyan waste and the western Sahara lies the plateau of the central Sahara, which extends three-fourths of the way across the desert from northwest to southeast, is from 1900 to 2500 feet in elevation, and above it rise mountain ranges (Ahaggar, Tibesti, and Air), some of the peaks being 6000 to 9800 feet high and snow-crowned in winter. The Ahaggar mountain land is the source of several long, wide river valleys, now waterless above ground, but contributing their subterranean supplies for the creation of a series of wells. The Nile lands and the eastern mountains are described in the articles Egypt and Nile.

The Sahara is dry in winter because it is then an area of high pressure, forcing the air currents outward in all directions and so receiving little moisture from the seas; and in summer, the northeast trades, blowing over the region and growing warmer as they near the equator, absorb the moisture. There is, however, considerable precipitation in the region of the central mountains. There are four months of winter and eight months of summer. The range of temperature, large for a tropical region, sometimes as much as 40° between day and night, is a result of the dryness of the air, which permits easy absorption by day and as easy radiation of the heat by night.

Except in the oases the desert is almost devoid of vegetation save for stunted and thorny shrubs in the western Sahara. One of the commonest shrubs is the gum acacia. Wild animals are also rare, though the Sahara is preëminently the home of the domesticated camel and the southwestern part of it is particularly well adapted for the ostrich. The game includes gazelles, wolves, hyenas, foxes, jackals, wild boars, and leopards. Granite, quartzite, and porphyry are everywhere the predominant rocks, as far as is yet known, except the Tertiary limestones along the Barka coast line of Tripoli and the similar formations newly discovered in the southwestern part of the desert. The date palm is the staple product of the oases and the principal source of revenue in the Sahara. Under the shade of the palm trees the natives raise

some wheat, barley, and vegetables. Cotton produced in most of the oases is the chief fibre used for native spinning and weaving. The coarse fibre esparto (alfa) thrives on the Saharan steppes of southern Algeria and Tunis and is an article of export. The chief mineral riches is salt, formed by evaporation in the salt pans of the south and west, in inexhaustible reservoirs that supply the whole Sudan. One of them in El Juf is 30 miles long by 12 broad; 20,000 camel loads of salt are extracted from it annually. Camels, sheep, goats, horses, donkeys, and a few cattle are the domestic animals.

Excepting dates and salt the commerce of the Sahara itself is insignificant, but the desert is the highway for considerable trade between the Sudan and Morocco and Tripoli. The chief trade routes (along the lines of wells) are (1) from Tafilelt (for Morocco and Algiers), via Tuat, to Timbuktu (this line has been unused in recent years because of repeated attacks upon the caravans by lawless tribes in Morocco); (2) from Gadames (for Tunis and Tripoli) to Tuat and Timbuktu on the one hand and to Sokota and Kano on the other; (3) from Murzuk or Tripoli, via Bilma, to Kuka, near Lake Chad, the most frequented of all the desert routes; (4) from Bengazi, via Ujila, to Wara, in the Kingdom of Wadai; (5) from the Nile valley, via numerous oases parallel to it, to Darfur. Another great camel route skirts the northern fringe of the desert and connects the principal inland towns of the Mediterranean states. The west is inhabited by Moorish tribes (Berbers), the centre by Tuaregs, the most formidable robbers of the desert and the greatest impediment to peaceful trade, and the east by Tibbu (Sudanese negro stock) and Bedouins. By a convention between Great Britain and France the right of France to all of the unappropriated Sahara west of the Nile basin has been recognized. The French Sahara includes over three-fifths of the desert, the remainder belonging to Spain (a part of the Atlantic coast), Italy (Tripoli), and England (Egypt). No estimates of the population of the Sahara are given.

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SAHARANPUR, sȧ-hä′rŭn-pōōr′, or **SEHARUNPOOR.** The capital of a district of the same name in the United Provinces of Agra and Oudh, India, 111 miles north by east of Delhi, on the Damaula Nadi River, near the Doab Canal (Map: India, C 3). The surrounding section has been made very fertile by means of irrigation and produces grain, cotton, and sugar cane. Saharanpur is the commercial centre of this region and also carries on considerable trade in native textiles. Pop., 1901, 66,254; 1911, 62,850. The city dates from the fourteenth century and during the Mogul régime was a popular summer resort. It was for a time under the control of the Sikhs and came under English sway in 1804.

SAHUAYO, sȧ-wä′yō. A town in the State of Michoacán, Mexico, 60 miles southeast of Guadalajara, on the southern margin of Lake Chapala. It is noted for its market gardens and cattle ranges. It was conquered by Nuño de Guzmán in 1530. Pop., 1900, 7408.

SAI, sī′ē. One of the many native South American words applied to monkeys. This one seems to be a general term for monkey and to lie at the root of many names, such as saimiri, sahui, sajou, saguin, saki, sapajou, ouakari, and similar terms which have come down to us through the writings of various early European travelers, by whom they have been variously spelled and changed.

SAIAZ, sī-ăz′. A small Athapascan (q.v.) speaking tribe in northern California.

SAIBLING, sī′blĭng. See CHAR.

SAID PASHA, sȧ-ēd′ pȧ-shä′, MEHEMED (1835–). A Turkish statesman, born in Constantinople. He served under Fuad Pasha in Syria in 1860, became Governor of Cyprus, and commanded a corps in the Russo-Turkish War. He was afterward made Secretary of State and member of the Reform Commission by Abdul Hamid II. In 1879 he became Prime Minister, was removed the following year, but returned quickly to power and remained in office till May, 1882. He was restored to his post in July of the same year, and in December became Grand Vizier, holding this office till 1885 and again for a few months in 1895. In 1908 he again became Grand Vizier, but was forced to resign by the Young Turks. During the Italian crisis in 1911–12 he was again called to the grand-viziership.

SAIF AL DAULA (sword of the empire), sä′ĕf ăl dou′lȧ, ABU'L HASAN ALI IBN ABU'L HAIJA ABDALLAH IBN HAMDAN (915–967). A ruler of Aleppo, famous as a patron of learning. It was in 944 that he took possession of Aleppo and its territory. In his wars with the Byzantine Emperor Nicephorus II Phocas (q.v.), he was not very successful; he lost Anazarbus, Tarsus, and Adana in Cilicia, and temporarily Marash and even Aleppo itself. When he died at Aleppo in 967 Antioch was besieged. But he kept a splendid court and surrounded himself with poets, philosophers, and scholars, among them such men as Abu Firas, the Hamdanid poet, Mutanabbi (q.v.), Abu'l Faraj al Isfahani (q.v.), Farabi (q.v.), and many others. Abu'l Ala al Ma'arri (q.v.), the great poet and freethinker, came to Aleppo soon after the death of Saif al Daula in the time of his son Sa'd al Daula. The dynasty ended in 1003 A.D. Consult: August Müller, *Der Islam im Morgen- und Abendland* (Berlin, 1885); R. A. Nicholson, *A Literary History of the Arabs* (Cambridge, 1907); C. I. Huart, *Histoire des Arabes* (Paris, 1913).

SAI'GA (Russ. *saĭgæ*, antelope). An interesting antelope (*Saiga tartarica*), with an extraordinary inflated nose, due to the size and position of the nasal bones, inhabiting the steppes of Asiatic Russia south of 55° N. The sheeplike expression is more pronounced in the females, as the male has erect, annulated horns (see Colored Plate of ANTELOPES); there is a

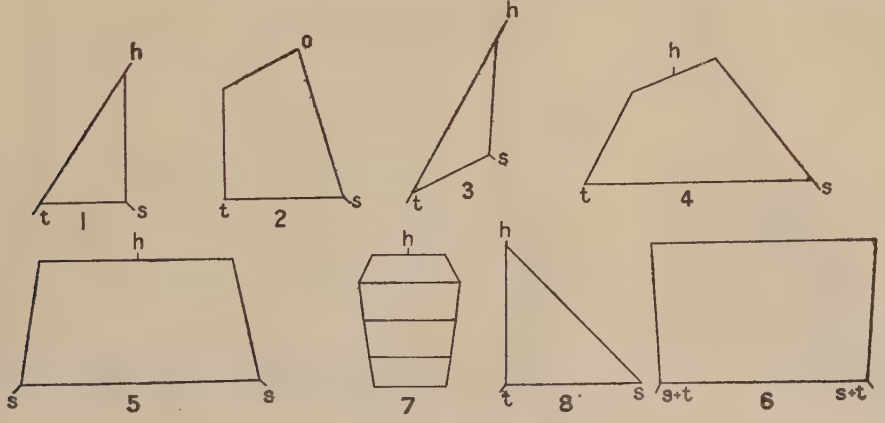
thick tuft of hair beneath each eye and each ear, and the animal's coat is fleecy. In some of its habits also it resembles sheep, especially in jumping and butting. This antelope inhabited western Europe as late as the time of Paleolithic man and was doubtless one of the objects of his chase. Its remains are common in caves of France and Belgium and have been found in Great Britain, and at least one sketch of the head of the animal has been found upon a bone.

SAIGON, sī-gŏn′; *Fr. pron.* sà′ê-gôn′. Capital of the French Colony of Cochin-China, on the right bank of the Saigon River, 34 miles from the sea (Map: French Indo-China, E 4). It is the principal economic centre of Indo-China and the chief French military and naval base in the East. Its excellent harbor, whose docks, etc., have been constructed at a cost of over $2,000,000, is accessible to the largest steamers. The city, which covers an area of over 6 square miles, is one of the finest in the Far East; it has retained an attractive Oriental individuality while taking on many improvements due to French art, culture, and efficiency in civic administration. The streets are broad and regular and they, as well as the public gardens, are shaded by magnificent trees. The city is lighted chiefly by electricity and has railway connections, electric tramways, and a filtered water supply. There are several French schools, a botanical garden, a library (over 12,000 volumes), an arsenal, machine shops, foundries, banks, rice mills, etc. The large commercial city of Cholon (with very few European inhabitants) is 3⅓ miles distant, being connected with Saigon by railway and electric tram. The notable buildings of Saigon include the government house, the palace of the Governor, the town hall, the post and telegraph building, the cathedral (built 1877–82 at a cost of $400,000), and the fine municipal theatre. The population of Saigon was estimated in 1913 at 72,000 (exclusive of over 2000 troops), as compared with 54,700 in 1905 and 33,400 in 1897. Chief components of the population as estimated for 1910: French, 11,853; other Europeans, 134; Annamese, 42,261; Chinese, 15,091; Indians, 1011; Malays, 256. The city has an elective council of eight French and four native members. Saigon, which the Annamese call Gia-dinh-Tinh, was the capital of Lower Cochin-China, a viceroyalty of the Annamese Empire; it was captured by the French, Feb. 17, 1859, and was included in the territory ceded to France by the Emperor of Annam under the treaty of June 5, 1862.

SAIGO TAKAMORI, sī′gō tä′kä-mō′rē (1826–77). A Japanese general, born at Kagoshima, Kiushu, in 1826. He was educated chiefly in Kyoto. He was one of those patriots who desired the overthrow of the shogunate, the restoration of the Mikado to his proper place as the sole ruler of the Empire, and the expulsion of foreigners. He soon took an influential position in his clan, but his views earned for him the displeasure of the Shogun's government, and when about to be seized he was banished for safety by his own clan to the island of Oshima (q.v.). In 1863 he was recalled and placed at the head of the provincial government. In the civil war which resulted in 1868 in the abolition of the shogunate, he was found fighting with distinction on the Imperial side. In 1873 he was named commander in chief of the land forces, but ere long, becoming dissatisfied with the new government and its adoption of so many foreign ideas, he retired to Kagoshima. Here he established a great private school, ostensibly for the promotion of learning, but really for the training of soldiers to be used in an attempt to revert to the former form of government, with the Satsuma clan and himself at its head under the Mikado. In February, 1877, they broke out in open rebellion with Saigo as leader. The struggle lasted until September 24, when Saigo's forces were utterly defeated and himself and his chief officers slain in battle. Posthumous honors were granted him in 1890.—His brother, SAIGO JUDO, also a soldier, was born in Satsuma in 1843, led the Japanese expedition to Formosa in 1874, and was a general in the Imperial army engaged in suppressing the Satsuma Rebellion. From 1879 to 1900 he was a cabinet officer.

SAIKO, sī′kyō, or **SAIKYO.** See KYOTO.

SAIL (AS. *segel, segl,* OHG. *segal,* Ger. *Segel,* sail, of uncertain etymology). A contrivance of canvas, matting, or similar material designed to utilize the pressure of the wind in the propulsion of vessels. Sails are generally made of flax or cotton canvas, but in China and in many

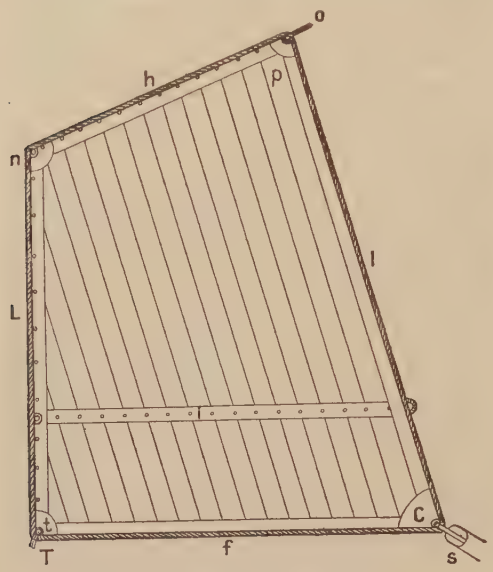


TYPES OF SAILS.

1, a staysail of ordinary cut; 2, a schooner's foresail or mainsail, a sloop's mainsail, a spanker, etc.; 3, a jib; 4, a lugsail; 5, a topsail, topgallant sail, etc.; 6, a square foresail or mainsail; 7, a Chinese junk's sail having battens or bamboos across it to keep it flat; 8, a leg-of-mutton sail.

partly civilized countries they are made of grass or of fibre mattings. While sails are made in various shapes, they are usually triangular or quadrilateral.

The letters *h*, *s*, *t*, attached to the various figures, indicate the position of the halyards, sheets, and tacks. Some sails are not hoisted,



FORE-AND-AFT SAIL—MAINSAIL.

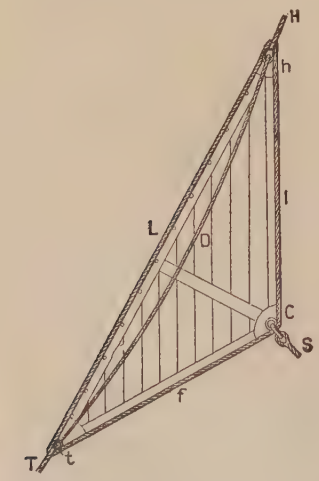
therefore they have no halyards; others are drawn down by their sheets alone and have no tacks; some, which are spread by booms, have the sheets secured to the boom instead of the sail, and some have both tacks and sheets at the same corner. The tack is a rope which secures the forward lower corner of a sail. In the case of square sails, which secure to yards above and with the keel, one tack is hauled forward and one sheet is hauled aft.

Typical sails on a larger scale than in the diagram are shown in the accompanying figures, and the letters indicate parts of the sail and the ropes called gear attached to it: *B*, buntline; *b*, bowline; *C*, clew; *c*, clew line; *D*, downhaul; *E*, head earing; *f*, foot of sail; *g*, bunt glut for buntwhip; *H*, halyards; *h*, head of sail; *L*, luff of sail; *l*, leech of sail; *l'*, leech line; *n*, nock or throat of sail; *p*, peak of sail; *R*, reef tackle; *r*, reef band of sail, carrying reef points; *S*, sheet; *T*, tack, the rope which secures the corner of the sail (also called the tack) *t*, to the deck or mast.

Canvas sails are made up of narrow strips (called cloths) of canvas running up and down the sail. These are lapped about 1½ inches and both edges sewn with an overhand stitch. Around the edges of the sails are additional canvas strips called tabling, clew patches, etc.; and across it are strain bands, buntline cloths, reef bands, etc. The edges of the sail are strongly sewed to the roping, which goes entirely round and adds greatly to the strength as well as serving to attach the gear to the sail.

As applied to ships sails are of two types, square and fore-and-aft. Square sails are bent to yards which pivot about their middle. Fore-and-aft sails pivot at the forward edge (or near it in the case of lugsails) and are bent to gaffs, masts, or lugs, or are hoisted on stays. A vessel can carry more canvas if square-rigged, but the sails are heavier and less easy to handle, and a fore-and-aft-rigged vessel can usually lie nearer the wind in sailing. Square-rigged vessels, in addition to their square sails, have some fore-and-aft sails, as the jibs, staysails, trysails, and spanker. See SHIP.

The lower sails of a square-rigged vessel are called the courses; they consist of the foresail



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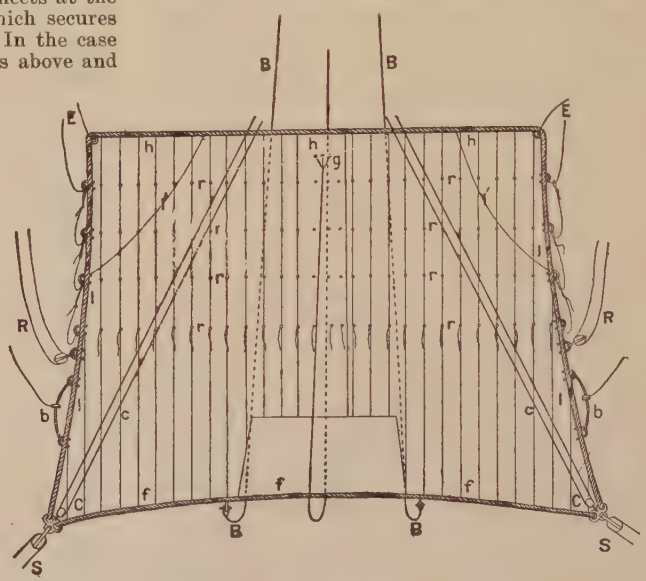
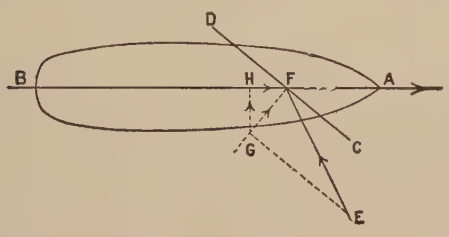


TOPSAIL AFTER SIDE.

below, the ropes at each lower corner are called sheets; but square sails which hang from a yard and have no yard below them have tacks leading forward from their lower corners and sheets leading aft. When the sail is set at an angle and mainsail (and in some ships the mizzen or crossjack). The sails above these are the topsails—fore, main, and mizzen. Above the topsails are the fore, main, and mizzen topgallant sails; and above these again the fore, main, and

mizzen royals. In some very lofty merchant ships there are skysails above the royals. In recent years the merchant practice has been to cut the topsail in two parts, called the upper and lower topsails. This plan saves reefing close down; instead of reefing, the upper topsail is furled. Moreover, the sails are of less unmanageable dimensions for handling with small crews.

Sails are hoisted with ropes called halyards; hauled out flat with sheets or outhauls (on booms and gaffs); pulled up to the yard for furling by means of clew lines (at lower corners), buntlines (made fast at foot), leech lines (at side), and buntwhip (middle); and pulled up to the yards for reefing by reef tackles. Square sails are bent (i.e., attached by lashings) to iron rods (called bending jackstays) on the yards with rope-yarn stops called robands; fore-and-aft sails are bent to travelers or hanks sliding up and down stays or railways (on masts) or to hoops sliding up and down the masts. Fore-and-aft sails are either lowered when furled or pulled in and furled up and down the mast. In the latter case they are pulled in by the brails. Jibs and staysails are hauled down by downhauls. When the force of the wind reaches a certain point, the light sails are furled and the other sails reefed by tying up parts of each to its yard or boom by means of small, short ropes called reef points. In severe storms heavy sails of small area called storm sails are bent in place of certain of the ordinary sails, which are used except in very strong



winds. In the severest hurricanes no sail can be carried, except, possibly, a tarpaulin laid against the mizzen rigging, which serves to keep the vessel partly up to the seas.

The action of the wind upon the sails is best shown by a diagram. Let *AB* represent a ship moving in the direction *BA*, *CD* one of her sails, *EF* the apparent direction of the wind. Then if *EF* represents in length the force of the wind, *GF* will be the resolved component at right angles to the sail and *HF* the effective resolution of this component applied to pushing the ship ahead. The component *GH* will tend to push the ship sideways (give her leeway) or heel her over. It is evident that, as the wind draws aft, less of its power is lost, but a wind directly aft is not the best for sailing, as the sails will not all draw when it is in this quarter. Most ships sail best with the wind between the quarter and the beam. Some fore-and-aft sails are in two parts, a broad strip along the foot being laced to the upper part. To reduce the area of the sail, instead of reefing by drawing up the foot and tying it with reef points, the broad strip mentioned, which is called a bonnet, is removed.

SAILER, zī'lẽr, Johann Michael (1751–1832). A German Catholic theologian, born at Aresing in Upper Bavaria. He entered the Society of Jesus in 1770 and was ordained priest in 1775, in 1780 was made professor of dogmatics at Ingolstadt and in 1784 professor of pastoral theology and ethics at Dillingen. In 1794 he was deprived of his chair because of his mysticism, but in 1799 was appointed professor at the seminary of Ingolstadt. The next year he went with the seminary on its removal to Landshut. Here he remained as professor of pastoral and moral theology until 1821, then becoming prebendary of Regensburg. In 1829 he became Bishop of the same see. His influence was very great throughout Germany in behalf of renewed spiritual activity within the Roman Catholic church and in counteracting positivism. His complete works were edited by Widmer (40 vols., 1830–42). Consult Georg Aichinger, *Johann Michael Sailer* (Freising, 1865).

SAILFISH (so called from the shape of the dorsal fin). 1. A fish (*Istiophorus nigricans*) of the warmer waters of the Atlantic, especially about the West Indies, where it is called spikefish, boohoo, and by various Spanish names. It is very similar in character and habits to the swordfishes (q.v.), but has a shorter and less flattened sword and the skin is rougher. Several other species are known in Eastern waters. See Plate of Spearfish and Swordfish.

2. A carp sucker. See Skimback.

SAILINGS. The term applied in navigation (q.v.) to the different methods of conducting a ship from one point to another and the solution of problems connected with these methods. They are (*a*) plane sailing; (*b*) traverse sailing; (*c*) parallel sailing; (*d*) middle-latitude sailing; (*e*) Mercator sailing; (*f*) great-circle sailing. So far as the track of the ship is concerned the first five of these are identical, for in all of them the ship's track is along the rhumb line or loxodromic curve; these sailings, therefore, are merely different methods of computing the same problem. In great-circle sailing, however, an attempt is made to follow the great circle of the earth which passes through the points of departure and arrival.

In **Plane Sailing** the small portion of the earth under consideration is regarded as a plane.

In Fig. 1 let *W* be the point of departure and *A* the point of arrival. Then if *NS* is a north and south line (part of the meridian through *W*), the angle *NWA* is the course. Draw *WE* perpendicular to *NS* and *AE* parallel

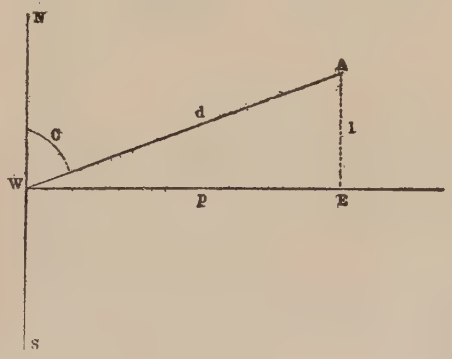


Fig. 1.

to *NS*. If we regard as a plane the portion of the earth's surface under consideration, the vessel in moving from *W* to *A* will have changed her latitude by an amount equal to *AE* and her

longitude by an amount equal to *WE*. If we designate *WA* (the distance sailed) by *d*, *AE* (the change in latitude) by *l*, and *WE* (the distance gained in the direction in which longitude is measured) by *p*, we shall have $l = d\cos C$ and $p = d\sin C$. *AE*, or *l*, is called the difference in latitude; *AW*, or *d*, the distance; and *WE*, or *p*, the departure. If *d* is expressed in nautical miles and *C* in degrees, *l* will be given in minutes of latitude. (This is not exact, but the error is inappreciable in practice.) The departure, or *p*, will also be given in nautical miles. Departure in an easterly direction is sometimes called *easting*, and in a westerly direction, *westing*. The method of determining the relation between the departure (*p*) and the difference of longitude (*D*) is given under *Traverse Sailing*.

Traverse Sailing consists in computing the total gain in latitude and in departure when the ship's track is made up of several pieces, the whole track being called a traverse.

In Fig. 2 *W* is the point of departure and *H* the point of arrival; and *WABFGH* is the

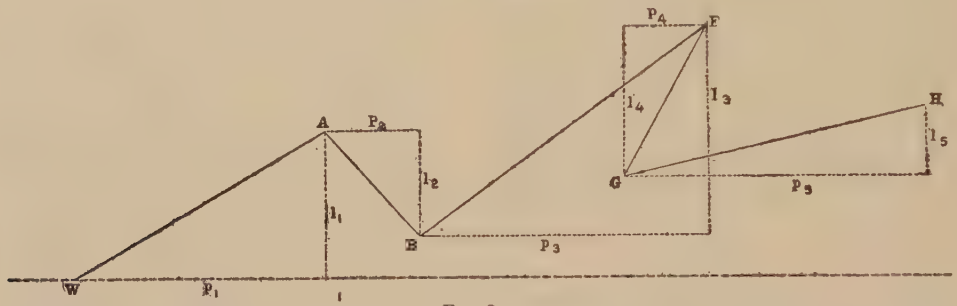


Fig. 2.

ship's track. The total gain in latitude is equal to $(l_1 - l_2 + l_3 - l_4 + l_5)$. The total gain in departure is equal to $(p_1 + p_2 + p_3 - p_4 + p_5)$. Each value of *p* and *l* may be computed from its own triangle.

In sailing due east or west along a parallel of latitude the difference of latitude (i.e., *l*) is zero and $p = d =$ distance sailed. But *p* is expressed in nautical miles. To determine how

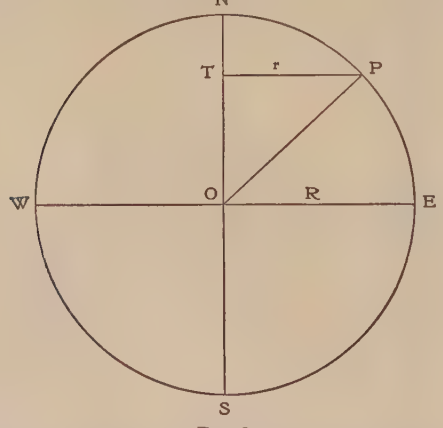


Fig. 3.

many minutes of longitude it corresponds to, we must determine the length of a minute of longitude.

In Fig. 3 *WNES* is the meridian of the earth passing through the point *P*. $OE = R =$ the equatorial radius of the earth. $TP = r =$ the radius of the circle of latitude passing through the point *P*.

$$\frac{\text{Circumference of circle of latitude}}{\text{Circumference at equator}} = \frac{2\pi r}{2\pi R}.$$

Each of the circumferences is divided into the same number of minutes of longitude; therefore

$$\frac{x'}{x} = \frac{\text{length of a minute of longitude at } P}{\text{length of a minute of longitude at equator}} = \frac{r}{R}.$$

Since the earth is very nearly a sphere, we may without serious error assume it to be so. (See Latitude and Longitude.) Then we have $TPO =$ angle $POE = L =$ latitude of *P* (nearly); also $OP = OE$ (nearly); and $\cos L = \frac{r}{R}$, $x' = x\cos L$. If *p* (= departure) correspond to a certain number of miles measured along the parallel of latitude, then *p* is equal to $\frac{p}{\cos L}$ minutes of longitude, or if we call the difference of longitude *D*, we have $D = p\sec L$. Having obtained the value of *p* by means of the formulæ of plane and traverse sailing, we find *D* by the formula $D = p\sec L$. The value of *l*, *p*, and *D* may be picked out of a table of right triangles such as is given in Bowditch's *Navigator* and other works of the kind, or the triangle may be solved in the usual trigonometrical manner.

Parallel Sailing is a special case of plane sailing or traverse sailing in which the course is east or west along a parallel of latitude. The formulæ may be deduced from those for traverse or plane sailing by putting $C = 90°$.

Middle-Latitude Sailing. The latitude (*L*) used in the foregoing formulæ is that of the point of departure. If the distance sailed is considerable and the change in latitude more than a few miles, it is evident that the resulting difference of longitude will be considerably in error, for the length of a minute of longitude at the latitude *L* differs from the length of a minute at *L'* (the latitude at the point of arrival). The exact average length of a minute of longitude is slightly greater than the mean of its lengths at the latitude of *L* and *L'* and slightly less than its length at the latitude of $\frac{L + L'}{2}$, but the error is not large for ordinary cases, and it is customary to use the formula $D = p\sec\left(\frac{L + L'}{2}\right)$; and this, together with $l = d\cos C$ and $p = d\sin C$, which have already been given, constitutes the formulæ used in computing a ship's position by dead reckoning

(q.v.) when the latitude and longitude of the point of departure and the courses and distances sailed are known. Thus, suppose a ship leaves a place of which the latitude is 30° N. and the longitude 60° W. and sails northeast 100 miles and then S.S.E. 60 miles; required, the latitude and longitude of the place of arrival. The following table is prepared:

COURSE (C)	Distance (d)	Diff. lat. (l)	Dep. (p)	Diff. long. (D)
N.E.	100	+70.7	−70.7	−82.1
S.S.E.	60	−55.4	−23.0	−26.8
		+15.3	−93.7	−108.9

The latitude of the place of arrival is therefore 30° 15′ 18″ (30° + 15′.3) and the longitude 58° 11′ 06″ (60°−1° 48′.9). When the distances sailed are short it is customary to find the sum of the departures and pick out (from the table of right triangles) the difference of longitude corresponding to the sum, using the mean of the latitudes of the place left and the place reached. While not so exact it is sufficiently so for ordinary purposes of navigation; in the example under consideration the error would be about one-half a minute of longitude.

Mercator Sailing is a more accurate method of determining the latitude and longitude of the place of arrival or the course and distance between places of which the latitude and longitude are known. A complete demonstration of the method requires too much space for insertion here. (See MAP.) The formulæ used are: $l = d\cos C$; $L' = L + l$; $p = d\sin C$; $m = M' - M$; $D = m \tan C$; $\lambda' = \lambda \pm D$. In these formulæ the symbols have the same meaning as in the other sailings. In addition M and M' are the meridional parts or augmented latitudes corresponding to the latitudes of the point of departure and point of arrival respectively and λ and λ' are the longitudes of these points. In the accompanying sketches Fig. 4 is designed to show the actual shape of a segment of the earth in which P is the pole, EQ a portion of the equator, PE and PQ meridians, and AB, GH, and JK portions of parallels of latitude. Fig. 5 represents the same segment of the earth on Mercator's projection. $E'Q'$ is equal to EQ, as are also $J'K'$, $G'H'$, and $A'B'$. In Fig. 4 the line EB is a portion of a loxodromic curve or rhumb line passing through E and B and making the same angle with the meridans PE and PQ and all the other meridians. In Fig. 5 the lines $A'E'$ and $B'Q'$ are straight and parallel; the angles between the lines $E'B'$ and $A'E'$, and $E'B'$ and $B'Q'$, are the same as the ones between EB and AB, and EB and BQ; and, in order that this condition shall hold—since $A'B'$ is longer than AB and since $A'E'$ and $B'Q'$ are parallel—it is necessary that $A'E'$ and $B'Q'$ be longer than AE and BQ. $A'E'$ and $B'Q'$ are called the augmented latitudes of the points A and B; similarly $G'E'$, $H'Q'$, $J'E'$, and $K'Q'$ are the augmented latitudes of the points G, H, J, and K. It follows from the foregoing that the loxodromic line is a straight line when laid down on a Mercator's chart, and this is what makes the charts constructed upon that projection so convenient and so widely used. While Mercator's charts are almost universally employed for ocean navigation, Mercator sailing is used very little. The ordinary unavoidable errors of navigation are sufficiently large to render the slight superiority in accuracy over middle-latitude sailing of no practical value except where the distances are very great or where the ship's track crosses the equator between the points of arrival and departure.

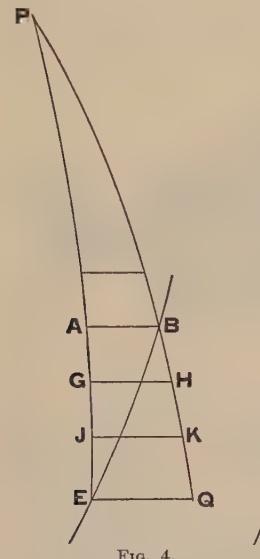


FIG. 4.

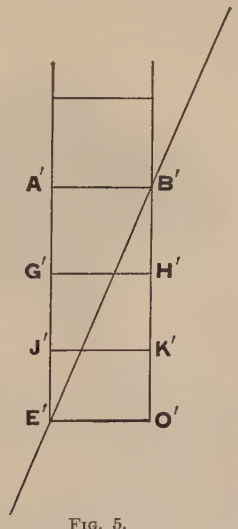


FIG. 5.

In **Great-Circle Sailing** a ship is made to follow as closely as practicable the arc of the great circle of the earth passing through the points of departure and arrival. Since the shortest line between any two points of a sphere is the arc of a great circle passing through the points, it follows that a ship which moves from one point to another on the earth's surface will pass over the shortest route when she follows the arc of the great circle passing through those points. Theoretically, therefore, ships should always sail on great circles. Practically this is impossible and is not even generally desirable. Great circles make different angles with every meridian they cross, so that the course would be constantly changing. To effect this constant change would be difficult and very troublesome. Furthermore, to follow the great circle rigorously would often lead the ship into bad weather or dangerous localities or into regions where the currents and winds are adverse. The sole advantage is the shortening of the distance sailed. By determining points on the circle and sailing along the rhumb line from point to point, the distance passed over may be made substantially the same as on the great circle, provided the rhumb-line tracks be made sufficiently short. In many cases it is desirable to follow quite closely the great circle for some distance and then the rhumb-line course to some distant point on the circle, which is again followed quite closely to the designed point of arrival.

The determination of numerous points upon the great circle involves considerable computation work and, while not difficult, it is beyond the capacity of rule-of-thumb navigators. To adapt great-circle sailing to the comprehension of such navigators and to avoid laborious computation, many devices have been invented, such as charts on the gnomonic projection, the spherograph, great-circle protractors, etc. Of these the gnomonic charts are decidedly the simplest

and most practical. The projection (see MAP) is upon a plane tangent to the earth at some selected point on the surface, and the point of sight is the centre of the earth. As all planes cutting great circles out of the earth pass through the earth's centre, they also pass through the point of sight, and the lines they cut in the plane of projection are straight lines. It is evident, therefore, that the straight line joining any two points on the chart is the projected great-circle arc. The meridians and parallels of latitude being properly projected on the chart, it is very easy to obtain the latitude and longitude of as many points of a great-circle arc as we wish. These points may be transferred to a Mercator chart and the courses between them obtained in the usual way, or they may be determined from the gnomonic chart itself, but this is usually unnecessary.

Various other means of graphically solving great-circle problems have been devised. Probably the earliest was the great-circle protractor of Prof. W. Chauvenet, U.S.N. About the same time Stephen Martin Saxby, of the British navy, designed a very similar instrument, which was called the spherograph. Admiral C. D. Sigsbee, U.S.N., designed a great-circle protractor many years later, and afterward devised a new form of it which is now issued by the Hydrographic Office of the United States navy. These inventions utilize the stereographic projection of a hemisphere in which the meridians and parallels of latitude are shown.

The spherograph consists of a card upon which is the stereographic projection of a hemisphere with the meridians and parallels of latitude drawn and marked. Over this and pivoted by a pin upon the same centre there is an exactly similar projection of a hemisphere upon a transparent disk. All the meridians are great circles; therefore, if we consider the bounding meridian of the lower projection as that of the place of departure and mark the point upon it at the proper latitude, it is very easy to obtain the great circle leading to any other point as follows: turn the transparent disk until its pole falls upon the marked point of departure. Every meridian of the transparent disk is now a great circle. If the point to be arrived at is marked on the lower disk in its proper latitude and longitude (reckoning the latter from the meridian of the point of departure), the meridian of the transparent disk which passes through it is the great circle connecting it with the point of departure. It is evident that this instrument is capable of graphically solving spherical triangles and other astronomical problems.

Admiral Sigsbee's protractor is simpler and perhaps slightly slower in operation for some problems, but it is more easily handled, less likely to be injured and made useless on board ship, and is larger and more accurate. It consists of a large sheet of heavy smooth paper or thin cardboard upon which the hemisphere is stereographically projected. The points of departure and arrival are marked upon this as in the spherograph. In addition, upon a sheet of tracing paper laid over the projection, you mark the centre, the point of departure, and the point of arrival. Turn the paper (keeping the centre always over the lower one) until the point of departure falls on the pole. The meridian which passes through the point of arrival is the great circle. Trace such portion as you wish, turn the paper back to the first position, and pick up the latitude and longitude of as many points as you want. Admiral Sigsbee's protractor readily lends itself to the graphical solution of a very large number of astronomical problems. For bibliography see NAVIGATION.

SAIL LIZARD. A large Oriental lizard (*Lophurus amboinensis*), allied to the frilled lizard (q.v.), sometimes a yard long, with a very compressed olive-green body and tail, the latter surmounted for half its length by a high, serrate

THE SAIL LIZARD.

crest, supported by spines from the vertebræ. It is found from Java to the Philippines, dwells in the jungle near streams, eats almost everything, and when frightened rushes into the water and endeavors to conceal itself on the bottom, where it can readily be taken by a net. Its flesh is sought for food.

SAILOR'S-CHOICE. A common and highly valued food fish (*Orthopristis chrysopterus*) along the sandy southeastern coast of the United States, belonging to the family of grunters (Hæmulidæ), called pigfishes in this genus. The form is ovate-elliptical and the length is 12 to 15 inches. The same name is given to several

SAILOR'S-CHOICE (*Lagodon rhomboides*).

allied fishes, and especially to a small sparoid, or porgy (*Lagodon rhomboides*), also called pinfish, a beautiful silvery blue and gold fish of the Gulf coast.

SAIN'FOIN (Fr. *sain-fon*, OF. also *sainct foin*, *saintfoin*, from *sain*, from Lat. *sanctus*, holy, less probably from Lat. *sanus*, sound + *foin*, from Lat. *fœnum*, hay), or ESPARSETTE (*Onobrychis sativa* or *viciæfolia*). A perennial pink-flowered leguminous plant, native to the temperate parts of Europe and western Asia and widely cultivated in Europe for pasturage and hay, but little in the United States. The plant grows to from 1 to 2 feet high and has rather long pinnate leaves. The fruit consists of short single-

seeded pods. It prefers a light, dry, calcareous soil, with a permeable, well-drained subsoil. It is often grown on soils too dry or too barren for clover. The culture of sainfoin is similar to that of alfalfa. Usually, however, only one cutting is made a year. From 1½ to 2½ tons of hay per acre are obtained, and the yield of seed ranges from 10 to 25 bushels. It does not endure close pasturing.

SAINT (OF. *saint, seint, sainct,* Fr. *saint,* from Lat. *sanctus,* holy, from *sancire,* to hallow; connected with Skt. *sañj,* to adhere). For a title beginning with the word SAINT, not included below, see under the second term of that title.

SAINT. A name applied in the New Testament to the members of the Christian community generally, but early restricted in ecclesiastical usage to men and women of special eminence for personal holiness. The earliest class of saints to receive distinct recognition was naturally that of martyrs. (See MARTYR.) The name "confessors" was originally applied to those who had exhibited signal courage and constancy in professing the faith, without the final crown of martyrdom, but later was used of male saints in general who were not martyrs. Women are honored either as virgins, matrons, or widows. For the methods by which the title of saint has been conferred in early and in modern times, see CANONIZATION.

In the history of religious controversy there has been much discussion as to the status of the departed saints and their relation to the Church on earth. That there is some practical relation is contended as a logical sequence from the article of the Apostles' Creed which declares belief in the "communion of saints." But while the Council of Trent affirms that it is a good and useful thing to invoke the saints on account of the benefits to be obtained from God by their aid, Protestants generally contend that such invocation is not only useless, since there is no certainty that the departed can hear our prayers, but positively unlawful, as trenching on the worship due to God and derogating from the mediatorial office of Christ. The first objection is met by the theory that the saints are in the immediate presence of God and, gazing upon the beatific vision, "behold with open face as in a glass" all that God wills them to know of what is happening on earth. It is further asserted that there is an infinite difference between the worship paid to God as the Supreme Lord of the universe and the address to the saints, which is the same in kind as that made without objection to venerated friends on earth. In Catholic theology the first is called *latria* and the last *dulia* worship and invocation. The last objection is answered by emphasizing the belief that the prayers of the saints gain their efficacy only by virtue of their union with the all-prevailing mediation of Christ. For the veneration paid to images and relics of the saints, see IMAGE WORSHIP; RELICS.

Bibliography. The most extensive as well as most scholarly is the collection by the Bollandists (q.v.), *Acta Sanctorum* (q.v.). Consult also: Alban Butler, *Lives of the Fathers, Martyrs, and Other Saints* (original ed., London, 1756–59; new ed., ib., 1896); *Lives of Saints and Servants of God* (ed. by F. W. Faber, ib., 1843–44); Mrs. A. B. Jameson, *Legends of the Monastic Orders* (ib., 1867); Gibson, *Short Lives of Saints for Every Day in the Year* (ib., 1896–97); Sabine Baring-Gould, *Lives of the Saints* (new ed., ib., 1897–98); Mary Hamilton, *Greek Saints and their Festivals* (Edinburgh, 1910); Mrs. A. B. Jameson, *Sacred and Legendary Art* (new ed., 2 vols., Boston, 1911); M. E. Tabor, *Saints in Art* (New York, 1913); M. and W. Drake, *The Saints and their Emblems* (ib., 1914); Francis Bond, *Dedications and Patron Saints of English Churches: Ecclesiastical Symbolism; Saints and their Emblems* (Oxford, 1914). For British and Irish saints particularly, consult *Lives of the English Saints,* written by various hands, at the suggestion of John Henry Newman (ib., 1844–45; new ed., 1900 et seq.), and William Fleming, *A Complete Calendar of the English Saints and Martyrs for Every Day of the Year* (ib., 1902).

SAINT-ACHEUL, săn'tȧ'shēl'. A celebrated archæological site in the Somme valley, northern France. It gives name to the so-called Acheulean epoch in French archæology. It was characterized by great cold, and the fauna is a transition towards that of the more temperate climate that followed. See PALEOLITHIC PERIOD.

SAINT-AFFRIQUE, săn'tȧf'frēk'. A town of the Department of Aveyron, France, on the Dourdon River, 37 miles east of Albi (Map: France, S., G 5). The town has woolen and cotton factories and tanneries and a lively trade in wool, and is celebrated for Roquefort cheese, made from ewe's milk, chiefly in the mountain pastures around the neighboring village of Roquefort. The town successfully resisted the Prince de Condé in 1628. Pop. (commune), 1901, 6699; 1911, 6495.

SAINT ALBANS, ąl'bąnz. A municipal borough in Hertfordshire, England, situated on a picturesque hill 20 miles northwest of London (Map: England, F 5). It is close to the site of Verulamium, the most important town in the south of England during the Roman period. King Offa II of Mercia, in 793, founded an abbey in memory of St. Alban, a Roman soldier and the protomartyr of England, who died at the end of the third or the beginning of the fourth century. The town grew up about the abbey, which became the most important in England. During the Wars of the Roses the place was the scene of two battles; the first was in 1455, when the Lancastrians were defeated and Henry VI was made a captive; the second in 1461, when the Yorkists were defeated. (See ROSES, WARS OF THE.) In 1877 St. Albans became a bishop's see. The abbey church is cruciform and one of the largest in England. Its length is 550 feet, its breadth 192 feet, and its Norman tower is 144 feet high. Its earliest portions date from about 1080. The church underwent, in 1875, an extensive restoration. The gate, which is now a school, is the only extant portion of the other monastic buildings. In St. Michael's Church there is a monument to Lord Bacon, who was Baron Verulam and Viscount St. Albans. Among the modern buildings are the courthouse, the corn exchange, the prison, two hospitals, a technical school, and almshouses founded in 1734. The principal industries are straw plaiting and the manufacture of silk and brushes. Pop., 1901, 16,019; 1911, 18,133.

SAINT ALBANS. A city and the county seat of Franklin Co., Vt., 45 miles northwest of Montpelier, on the Central Vermont Railway (Map: Vermont, B 2). It is attractively situated at an elevation of 400 feet, about 2 miles distant from Lake Champlain. Near by are the Aldis and Bellevue hills, which afford extended

views of the Green Mountains, Lake Champlain, and the Adirondacks. The city has a public library, the Warner Home for Little Wanderers, a hospital, and the Villa Barlow Convent. St. Albans is noted as the centre of a large dairying district and has a large creamery, a condensed-milk factory, a large cotton mill, and manufactories of iron and steel bridge work, iron roofing, clothing, gasoline engines, farm machinery, and furniture. Shops of the Central Vermont Railway also are here. Pop., 1900, 6239; 1910, 6381.

St. Albans was incorporated as a village in 1859 and was chartered as a city in 1896. It was a rendezvous of insurrectionist leaders during the Canadian troubles of 1837–38. On Oct. 19, 1864, it was raided by Confederates from Canada, who seized more than $200,000 deposited in the local banks. In 1866 a party of Fenians started from St. Albans to attack Canada, and later a force of United States troops under General Meade was stationed here to prevent further acts of hostility against Great Britain. Consult *Vermont Historical Gazetteer* (Burlington, 1867–82).

SAINT ALBANS, Viscount. See Bacon, Francis.

SAINT ALDWYN, ąld'wĭn, first Viscount. See Hicks-Beach, Michael Edward.

SAINT ALEXANDER NEVSKI, nĕf'skĕ. A Russian military order founded by Peter the Great in 1722. Only those of the rank of major general are eligible for the distinction. The decoration is an eight-pointed red cross with double eagles in the angles and in the centre an image of the saint on horseback, armed.

SAINT-AMAND, săn'tȧ'măn'. A town in the Department of Nord, France, 7 miles north by west of Valenciennes, at the confluence of the Elnon and Scarpe rivers (Map: France, N., J 2). It is noted for its mineral springs and baths. The town is important for its manufacture of iron and steel. Pop., 1901, 13,705; 1911, 14,454.

SAINT-AMAND, Imbert de. See Imbert de Saint-Amand.

SAINT-AMAND-MONT-ROND, -môn-rôn. The capital of an arrondissement in the Department of Cher, France, 27 miles north by west of Montluçon, on the Cher River (Map: France, N., H 6). In the vicinity are interesting ruins of an old Roman city. The town is also noted as the birthplace of the great Condé. It played an important part in the Hundred Years' War. Pop., 1901, 8326; 1911, 8584.

SAINT-AMANT, săn'tȧ'măn', Antoine Girard, Sieur de (1594–1661). A French poet, born probably near Rouen. Gautier calls him the creator, with Scarron and Théophile de Viau, of burlesque poetry in France. The most important of his poems are: *Moïse sauvé des eaux*, which contains some beautiful descriptive writing; *Solitude*, which Boileau calls his best work; and *Albion*, a curious picture of English manners. He published his *Œuvres poétiques*, in four parts (1629, 1631, 1643, 1649), and a *Dernier recueil* in 1658. Consult Théophile Gautier, *Les grotesques* (Paris, 1844).

SAINT-AMOUR, William of. See William of Saint-Amour.

SAINT AN'DREWS. A royal burgh, seaport, and watering place in Fifeshire, Scotland, on St. Andrews Bay, 15 miles southeast of Dundee (Map: Scotland, F 3). It has two small harbors and is one of the most fashionable of Scottish summer resorts, and its fine golf links stretch along the shore to the north of the town for 2 miles. St. Andrews has been noted as an educational centre since 1120 and contains Madras College, attended by over 900 boys. (See Saint Andrews, University of.) The manufacture of golf clubs and balls is the chief industry, St. Andrews being the headquarters of golfing in Scotland. Fishing gives considerable employment and coal is mined in the neighborhood. There are ruins of the cathedral commenced in 1160 and destroyed in 1559, of the castle dating from 1200, and of a Dominican monastery founded in 1274. Pop., 1901, 7621; 1911, 7851. Consult the monographs by Lang (London, 1893) and Boyd (ib., 1892; another vol., 1896).

SAINT ANDREWS, University of, at St. Andrews (q.v.), Scotland. The oldest Scottish university. It was founded in 1411 by Bishop Henry Wardlaw and confirmed by a bull of Pope Benedict XIII. It was modeled in most respects after the University of Paris (q.v.), and from the very beginning received the encouragement of the Scottish kings. By the middle of the sixteenth century there existed already three colleges—St. Salvator, St. Leonard's, and St. Mary's, established in 1450, 1512, and 1537, respectively. They were at first devoted mainly to theology and philosophy, and although originally intended to combat heresy, they became the strongholds of Protestantism, particularly St. Leonard's. In 1579 the colleges were reorganized, St. Salvator and St. Leonard's assuming the instruction of philosophy, law, and medicine, while theology was taught at St. Mary's. The secular colleges were united in 1747. University College, founded by Dr. John Baxter and Miss Baxter in 1880, at Dundee, became affiliated with St. Andrews in 1890. The university library, founded in 1456, contains over 150,000 volumes and manuscripts. The university's attendance in 1912–13 was 510.

SAINT ANDREW'S CROSS. A cross with beams forming the letter X, so named because St. Andrew is said to have suffered on such a cross. Since it forms the initial of the Greek word for Christ, it was held in great honor. It is also called Burgundian cross, because it appeared in the Burgundian arms.

SAINT ANN, Order of. A Russian order founded in 1735 by Duke Charles Frederick of Holstein-Gottorp in memory of his wife, Anna Petrovna. In 1797 it was made a Russian order of merit, and its single class was divided into three, to which two classes for military candidates were subsequently added. The decoration is a red cross bearing the image of St. Ann, and is worn by the first class in connection with an eight-pointed star with the Imperial crown and the device "Amantibus Justitiam, Pietatem, Fidem." The first class confers hereditary nobility.

SAINT ANTHONY, Falls of. See Minneapolis.

SAINT ANTHONY'S FIRE. See Erysipelas.

SAINT-ARNAUD, săn'tȧr'nō', Jacques Leroy de (1796–1854). A French marshal, born in Bordeaux. He helped suppress the abortive rising in the Vendée in 1832 and afterward was sent to Africa. He defeated and captured the Algerian chief Bou-Maza in 1847 and was rewarded with the rank of brigadier general. Saint-Arnaud was in Paris at the revolution of 1848 and fought against the rioters at the head of a

brigade. In 1851, after a successful campaign against the Kabyles, he was made a general of division, recalled to France, and put in command of the Second Division of the Army of Paris. On Oct. 26, 1851, he was appointed War Minister and was one of the chief agents of Napoleon in the coup d'état of Dec. 2, 1851. A year later he was made a marshal of France and grand equerry to the Emperor. On the outbreak of the war in the Crimea Saint-Arnaud was put in command of the French forces. Soon after Saint-Arnaud succumbed to the hardships of the campaign, dying on board a French war vessel. His *Lettres* (2 vols., Paris, 1855) are autobiographical in nature.

SAINT ASAPH, sānt ăz'af. A city, standing on a small hill between the rivers Clwyd and Elwy, in the northwest of Flintshire, Wales (Map: Wales, C 3). Its trade is agricultural. The chief building is the cathedral, a cruciform structure, dating from 1284, on the site of a wooden structure founded before 596. Pop., 1901, 6158; 1911, 6766. Consult Walcott, *Memorials of Saint Asaph* (London, 1865).

SAINT-AUBIN, săn'tō'băn', Stéphanie Félicité Ducrest de. See Genlis, Countess de.

SAINT AUGUSTINE, ą'gŭs-tēn. A city and the county seat of St. Johns Co., Fla., 37 miles south by east of Jacksonville, on Matanzas Bay, on the Florida East Coast Canal, and on the Florida East Coast Railroad (Map: Florida, E 2). The oldest city in the United States, St. Augustine is especially attractive with its narrow streets, picturesque old houses, and interesting remains. The vicinity is one of remarkable beauty owing to its semitropical vegetation. In the central part of the city are ruins of the old wall erected by the early settlers as a protection against Indian incursions. Here, too, is the ancient fort of San Marco (now Fort Marion), begun about 1656 and finished a century later. It covers four acres. From this point southward extends the sea wall constructed by the Federal government—a popular promenade. An old Spanish monastery occupied the present site of St. Francis barracks at the southern extremity of the wall and now forms a part of the modern structure. Near the barracks is the Flagler Hospital. The old Governor's palace, on the Plaza de la Constitución, in the central part of the city, has been preserved and now serves as a United States customhouse and post office. The cathedral dates from 1793. Other features are the municipal buildings, the public library, State School for the Deaf and Blind, the Museum of the Institute of Natural Science, now quartered at Fort Marion, and St. Joseph's Academy. St. Augustine is of some importance as the centre of a farming, dairying, and stock-raising region, but is best known as a winter and health resort, being noted for its mild uniform climate. The mean annual temperature is 70° and the winter average 53°. There are several large hotels, among which is the Ponce de Leon, erected at a cost of $3,000,000. Across the bay from St. Augustine is Anastasia Island, with a lighthouse, wireless station, and quarries of coquina, a shelly formation which has been used since the Spanish régime for building and paving purposes throughout the city. The city has adopted the commission form of government. The water works are owned and operated by the municipality. Pop., 1900, 4272; 1910, 5494.

In 1513 Ponce de León, in search of the Fountain of Youth, seems to have visited the site of St. Augustine. Half a century later, in 1564, a company of French Huguenots passed here and settled a few miles to the north, on the St. John's River. Don Pedro Menéndez de Avilés, sent by Philip II of Spain to expel the intruders, stopped here, Aug. 28, 1565, St. Augustine's Day, and erected a fort. After butchering the French (September 20) at the St. John's he returned and established a settlement—the earliest within the present limits of the United States. St. Augustine was burned by Sir Francis Drake in 1586 and sacked by the piratical Captain Davis in 1665. Throughout its early history ill feeling between the Spaniards and the English colonists to the north was chronic. In 1681 a force from St. Augustine attacked the English settlements at Port Royal. Governor Moore of South Carolina made unsuccessful attacks on St. Augustine in 1702 and 1704, burning the greater part of the town on the former occasion; and in 1743 General Oglethorpe, having been ordered away from Georgia by the Spanish, marched to St. Augustine and besieged it unsuccessfully for 38 days. In 1763 it passed with the rest of Florida into English hands and was used as a military station during the Revolution, but it became Spanish again in 1783. In 1821 it was transferred to the United States, in pursuance of the Treaty of 1819. During the Civil War it was twice captured by Union armies. St. Augustine was ravaged by fire in April, 1914, and much of the old quarter of the city was destroyed. Consult: Fairbanks, *The History and Antiquities of St. Augustine* (New York, 1858); id., *The Spaniards in Florida* (Jacksonville, 1868); Reynolds, *Old St. Augustine* (St. Augustine, 1885); L. P. Powell (ed.), in *Historic Towns of the Southern States* (New York, 1900); A. M. Brooks, *Unwritten History of Old St. Augustine* (St. Augustine, 1909).

SAINT BARTHOL'OMEW. A small island of the Lesser Antilles belonging to the French Colony of Guadeloupe, and situated near the north end of the Leeward group 130 miles northwest of Guadeloupe (Map: West Indies, G 3). Area, 9.5 square miles. It is about 1000 feet high, arid and devoid of forest, but produces some sugar, cotton, and cacao. Pop., 1911, 2545. The island was colonized by the French in 1648, bought by Sweden in 1785, and bought back by France in 1877.

SAINT BARTHOLOMEW, Massacre of. See Bartholomew's, Massacre of Saint.

SAINT BERNARD, *Fr. pron.* săn bĕr'nàr'; *Eng. pron.* sānt bĕr-närd', Great. A mountain pass in the Alps (q.v.) east of Mont Blanc, 8120 feet above the sea, with a carriage road connecting the valleys of the Dora Baltea and the Rhone (Map: Switzerland, B 3). The famous hospice or monastery of St. Bernard, 17 miles from Aosta, in Italy, and 30 miles from Martigny, Switzerland, is almost at the summit of the pass beside a little lake which even in summer often freezes over. The hospice entertains yearly from 20,000 to 25,000 guests, who contribute only a small part of the $6000 to $8000 required to maintain the establishment. This monastery was founded in 962 by St. Bernard de Menthon. It is now occupied by twenty Augustine monks with seven assistants. It is their special mission with the aid of their famous St. Bernard dogs to rescue travelers who may be lost in the snow. In

the hospice are engravings and pictures given by grateful travelers, a collection of coins, and numerous antiquities found in the vicinity, among them fragments of brass tablets offered to Jupiter Pœninus by pious Romans after escape from danger. From Jupiter Pœninus, who had here at one time a temple dedicated to him, the range of mountains is called the Pennine Alps, the mountain itself by the Italians Monte Giove, and locally Mont Joux. This pass was much used by the Romans, particularly after the foundation of Aosta (q.v.), was improved by Constantine, traversed by the Lombards, by Charlemagne's uncle Bernard, by Frederick Barbarossa, and by large bodies of French and Austrian soldiers during the campaigns of 1798, 1799, and 1800.

Little St. Bernard is a pass 7180 feet above the sea southwest of Mont Blanc, connecting the valleys of the Dora Baltea and the Isère.

SAINT BERNARD, bĕr'nard. A city in Hamilton Co., Ohio, adjacent to Cincinnati, on the Baltimore and Ohio Southwestern, the Cleveland, Cincinnati, Chicago, and St. Louis, and the Norfolk and Western railroads, and on the Miami and Erie Canal. Noteworthy buildings are the high school, St. Clemens parochial school, and the city hall. It has immense soap factories and four large fertilizer plants. Pop., 1900, 3384; 1910, 5002.

SAINT BERNARD (sånt bĕr-närd') **DOG.** The largest of domestic dogs, often nearly 3 feet high at the shoulder and 150 pounds in weight. The race was developed from an unknown origin at the hospice of St. Bernard, in the Alpine pass of that name, whose monks have maintained the breed through centuries for the purpose of giving aid to belated travelers, or rescuing those lost in snowstorms. They are also used to test the practicability of a snow-covered track or the safety of an ice bridge. Their capacity for tracking and their keenness of nose equal that of the best bloodhound. They are very hardy dogs, yet in the middle period of the nineteenth century they were nearly exterminated, once by a pest that left but one, and once by an avalanche which carried away all but three of the monks' dogs. Excellent dogs for similar use have been bred and trained on the St. Gothard, Simplon, Grimsel, and Furka passes, and in other Alpine hospices. Two varieties of St. Bernards are recognized, the smooth-coated and the rough-coated. The shorter-haired dog shows better its true power and shape. The standard of the breed calls for a tall, erect figure, strong, muscular, and bony in every part; a powerful and imposing head, with a wide massive skull and an intelligent expression. The supraorbital ridges are strongly developed and form nearly a right angle with the horizontal axis of the head. A furrow runs up the centre of the forehead between the supraorbital arches. The skin on the forehead is wrinkled, but not deeply. The chops of the upper jaw are strongly developed, like those of the bloodhound, but turn with a graceful curve into those of the lower edge and are slightly overhanging. The nostrils are dilated and black; the ears lightly set on and close at the base, and the back edge standing away when the dog is listening; the eyes set more to the side than to the front, the lids showing a slight haw. The feet are broad and the toes strong, with a single or double dewclaw, giving an extended surface to the foot when on the snow. The coat is very dense, lying smooth, but in the rough-haired is considerably long and flat to slightly wavy, and the tail is bushier than in the smooth-coated variety. The color may be black, red, or white in well-defined patches. Consult works cited under DOG; and see PLATE OF DOGS.

SAINT BON, săn' bôn', SIMONE ARTURO (1823–92). An Italian admiral, born at Chambéry, March 20, 1823. He served in the Crimean War, distinguished himself at the siege of Ancona, and was decorated for bravery at the siege of Gaeta. The way he handled his ship, the *Formidabile,* in the Lissa campaign was a bright spot in that aggregation of errors and incompetence. In 1873 he became Minister of Marine. In this capacity he reorganized the Italian navy both in personnel and matériel. His views of naval construction were far in advance of his time and were not generally accepted for 30 years. His plans for battleships involved large size, very heavy guns, and thick armor or high speed. In the two types he adopted, the *Dandolo* and *Duilio* and the *Italia* and *Lepanto,* we have the prototypes of the all-big-gun battleship and all-big-gun battle cruiser of to-day. He died Nov. 26, 1892.

SAINT BONIFACE, bŏn'ĭ-fās. A city and the county seat of Provencher County, Manitoba, Canada, on Red River and on the Canadian Pacific, the Grand Trunk Pacific, the Canadian Northern, and the Great Northern railways (Map: Manitoba, F 4). It is the seat of the Roman Catholic Archbishop of Manitoba. Public buildings include a cathedral, college, seminary, orphanage, old folks' home, boys' academy, convent, two hospitals, and normal school. The industrial establishments include brick factories, lumber yards, planing mills, linseed-oil mills, ceiling and roofing plant, glass works, grain elevators, etc. There are also large livestock-market buildings and meat-packing plants. Pop., 1901, 2019; 1911, 7483.

SAINT-BRIEUC, săn'-brē'ē'. The capital of the Department of Côtes-du-Nord, France, 63 miles northwest of Rennes, at the mouth of the Gouet River (Map: France, N., C 4). Its port, Le Légué, is 1 mile distant to the north on the English Channel. It has a cathedral dating from the thirteenth century and recently restored, the pilgrim church of Notre Dame d'Espérance, also a thirteenth-century structure, and the church of Saint-Michel, a modern edifice. The town carries on a large coastwise trade in farm and garden produce and fish and is largely interested in iron and steel manufactures. A monastery was established here in the latter part of the fifth century by St. Brieuc, a Welsh missionary. St. Brieuc was the scene of much fighting during the Reign of Terror. Pop., 1901, 22,198; 1911, 23,041.

SAINT CATH'ARINE, ORDER OF. A Russian order instituted in 1714 by Peter the Great and originally intended as a special distinction for his consort Catharine, in recognition of her services in the Turkish campaign of 1711. The membership was subsequently extended to include all the princesses of the Imperial house and women of the nobility. The decoration, a diamond cross, has an oval medallion with an image of St. Catharine holding a cross, on which are the letters D. S. F. R. (*Domine, Salvum Fac Regem*).

SAINT CATHARINES. A city and the capital of Lincoln County, Ontario, Canada, on

the Welland Canal and on the Grand Trunk and the Niagara, St. Catherines, and Toronto railways, 12 miles northwest of Niagara Falls (Map: Ontario, F 7). The county buildings, city hall, armories, public library, Bishop Ridley College (an Anglican school for boys), a business college, and a collegiate institute, are notable features. The city has manufactories of boilers, axes, tools, paper, electric fittings, biscuits, incandescent lamps, baskets, knitted goods, shoes, beer, knives, flax products, etc. The manufactured output in 1910 was valued at $6,024,217. Pop., 1901, 9946; 1911, 12,484; 1915 (civic census), 14,741.

SAINT CATHARINE'S COLLEGE. A college founded at Cambridge, England, by Robert Wodelarke, or Woodlark, provost of King's College and chancellor of the university, in 1473 (charter in 1475), for a master and three fellows. It is and, save in the seventeenth century, has always been one of the smaller Cambridge colleges. There were, in 1913–14, a master, 6 fellows, and 26 scholars, besides sizars. Among the more distinguished members of the college may be mentioned Archbishop Sandys, Dr. Addenbrooke, founder of the hospital in Cambridge, and the naturalist John Ray. Consult G. F. Browne, *St. Catharine's College* (London, 1902).

SAINT-CHAMOND, săn'-shâ'môn'. A town in the Department of Loire, France, situated at the confluence of the Gier and the Ban, 8 miles by rail northeast of Saint-Etienne (Map: France, S., J 3). It is a flourishing, well-built town, and the centre of a district extensively engaged in the manufacture of laces and ribbons, has dye works and naval and railway workshops. There are coal mines in the vicinity. Pop., 1901, 15,469; 1911, 16,473.

SAINT CHARLES. A city in Kane Co., Ill., 35 miles west of Chicago, on the Fox River and on the Chicago Great Western, the Northwestern, and the (traction) Aurora, Elgin, and Chicago railroads (Map: Illinois, H 2). It possesses the St. Charles (State) School for Boys, Potawatamie Park, a public library, and a high school. There are manufactories of condensed milk, pianos, cut glass, hammocks, chandeliers, malleable iron, soil pipe, and stoves. Pop., 1900, 2675; 1910, 4046.

SAINT CHARLES. A city and the county seat of St. Charles Co., Mo., 14 miles northwest of St. Louis, on the Missouri River, spanned here by two fine bridges, one a great steel structure 6535 feet long, and on the Wabash and the Missouri, Kansas, and Texas railroads (Map: Missouri, F 3). It is the seat of the Lindenwood Female College (Presbyterian), opened in 1831, St. Charles College (Methodist Episcopal), chartered in 1837, and the Sacred Heart Academy, opened in 1818, and has the Emmaus Asylum for Epileptics, St. Joseph Hospital, Blanchette Park, and a fine courthouse. The car manufactory is one of the most extensive of its kind in the United States, and there are also manufactories of shoes, flour, wagons, oil engines, buggies, and beer. Settled in 1769, St. Charles was incorporated in 1849. It was the capital of the Northwest Territory and the first capital of the State (1820–26). Pop., 1900, 7982; 1910, 9437; 1915 (U. S. est.), 10,203.

SAINT CHARLES, Order of. An order of merit founded in 1858 by Charles III of Monaco, on the model of the Legion of Honor.

SAINT CHRIS'TOPHER, or Saint Kitts. One of the Leeward Islands, British West Indies, covering an area of 68 square miles (Map: West Indies, G 3). It is traversed in the centre by a mountain range, of which the highest peak, the extinct volcano Mount Misery, is 3711 feet high. The climate is healthful; the chief products are sugar and rum. Coffee and cotton are also cultivated to some extent. St. Christopher, with Nevis (q.v.) and Anguilla, was formed into a presidency of the Leeward Islands in 1882. Pop., 1901, 29,782; 1911, 26,283. Capital, Basse Terre. The island was discovered by Columbus in 1493 and settled by the English and French about 1623–25. It was ceded to Great Britain by the Treaty of Utrecht in 1713.

SAINT CLAIR. A city in St. Clair Co., Mich., 12 miles south of Port Huron, on the St. Clair River and on the Michigan Central Railroad (Map: Michigan, G 6). The manufacture of salt constitutes the chief industry. Pop., 1900, 2543; 1910, 2633.

SAINT CLAIR. A borough in Schuylkill Co., Pa., 2 miles north of Pottsville, on Mill Creek and on the Pennsylvania and the Philadelphia and Reading railroads (Map: Pennsylvania, J 5). It is situated in a hilly region containing extensive deposits of anthracite, the mining of which constitutes the leading industry. Miners' squibs and fuses and miners' caps are the principal manufactures. Pop., 1900, 4638; 1910, 6455.

SAINT CLAIR, Lake. A lake belonging to the Great Lakes system and situated between Lake Huron and Lake Erie and between the State of Michigan and the Province of Ontario (Map: Michigan, G 6). It is 27 miles long and 25 miles wide and has an area of 396 square miles. It receives the waters of Lake Huron through the St. Clair River and discharges into Lake Erie through the Detroit River. Its elevation above sea level is 576 feet, being 6 feet lower than Lake Huron and 3 feet higher than Lake Erie. Its greatest depth is 21 feet and in the north, where it borders on the mud flats of the St. Clair delta, it is very shallow, but a channel 20 feet deep has been maintained for steamers. See Great Lakes.

ST. CLAIR, Arthur (1734–1818). An American soldier. He was born at Thurso, Caithnessshire, Scotland, was educated at the University of Edinburgh, joined the British army as ensign, and in 1758 came to America with Admiral Boscawen. He served with distinction under Amherst at Louisburg and under Wolfe at Quebec, resigned his commission in 1762, and in 1764 settled in western Pennsylvania. In January, 1776, he joined the Colonial army with the rank of colonel. For his gallant services at the battles of Three Rivers, Trenton, and Princeton he was raised to the rank of major general in 1777 and placed in command at Ticonderoga. He was forced to abandon that place to Burgoyne and, although acquitted of blame by court-martial, lost his command. Remaining in the army as a volunteer, he again rose to important positions, distinguishing himself in the operations which ended with the surrender of Cornwallis. He was a member of the Continental Congress 1785–87, becoming its president in the latter year, and from 1783 to 1789 was president of the Pennsylvania State Society of the Cincinnati, in honor of which he named the city of Cincinnati in 1790. In 1789

he was made the first Governor of the Northwest Territory and in 1791, as commander in chief of the United States army, was sent on an expedition against the Miami Indians, which ended in the disastrous rout of his forces. A committee of investigation appointed by Congress exonerated him, but he resigned his command in May, 1792, and in 1802 Jefferson removed him from his governorship. His last years were spent in poverty and obscurity. Consult *A Narrative of the Manner in which the Campaign against the Indians in the Year 1791 was Conducted under the Command of Major-General St. Clair* (Philadelphia, 1812), and W. H. Smith, *The Life and Public Services of Arthur St. Clair* (2 vols., Cincinnati, 1882).

SAINT CLAIR RIVER. The outlet of Lake Huron. It is 41 miles long and flows south on the boundary between Michigan and Ontario, emptying into Lake St. Clair (q.v.) through a fan-shaped delta of seven channels (Map: Michigan, G 6). The river itself is navigable and one of the delta channels has been improved by canalizing a part of it and guarding it by embankments, forming the St. Clair Flats Canal. In 1891 a tunnel was built under the river between Port Huron and Sarnia, measuring with its approaches 3851 yards and connecting the Canadian Grand Trunk and the Chicago and Grand Trunk railways.

SAINT-CLAUDE, săn′-klōd′. The capital of an arrondissement in the Department of Jura, France, at the confluence of the Bienne and Tacon, 19 miles northwest of Geneva (Map: France, N., L 6). It is an episcopal see, with a fourteenth-century cathedral, the former church of an important abbey which was suppressed at the Revolution. The town has manufactures of toys, tortoise-shell combs, pipes, and snuffboxes, and is noted for its lapidary establishments. Pop., 1901, 10,499; 1911, 10,980.

SAINT-CLOUD, săn′-klōō′. A town of France, in the Department of Seine-et-Oise, situated on the declivity of a hill near the Seine, 5 miles west of Paris (Map: Paris and Vicinity). Pop., 1901, 6205; 1911, 6134. Its famous and beautiful park contains about 1000 acres, is embellished by spacious allées and a large cascade and fountain, and commands a fine view over Paris. The town figures often in the wars of the Middle Ages. Henry III was assassinated here in 1589 by the fanatical monk Jacques Clément. Saint-Cloud was long famous on account of its magnificent château, built by Mazarin and embellished by successive dukes of Orléans, who possessed it till 1782, when it passed into the hands of Marie Antoinette. Here Bonaparte, in 1799, was named First Consul, and in this place Charles X signed the ordinances which produced the revolution of 1830. During the siege of Paris (1870) the château was set on fire and destroyed by the artillery.

SAINT CLOUD, sānt kloud′. A city and the county seat of Stearns Co., Minn., 65 miles northwest of Minneapolis, on the Mississippi and Sauk rivers and on the Northern Pacific and the Great Northern railroads (Map: Minnesota, C 5). It is the seat of a State normal school and of the Minnesota State Reformatory. St. Raphael's Hospital, the Roman Catholic cathedral, the Federal building, the public library, and the home for the aged are other noteworthy features. St. Cloud is best known for its large granite interests, employing over 1000 men in some 30 quarries within a few miles. Excellent water power is derived from the rapids of the Mississippi. Iron and lumber products, paper, cigars, woolen goods, sleds, foundry and machine-shop products, stationery, brick, flour, and beer constitute the principal manufactures. There are here repair shops of the Great Northern System. The commission form of government is used. Pop., 1900, 8663; 1910, 10,600; 1915, 11,621; 1920, 15,873.

SAINT CROIX (kroi), or **SCHOODIC** (skōō′dĭc), **RIVER.** A river forming part of the boundary between Maine and New Brunswick (Map: Maine, E 3). It flows from the Schoodic or Grand Lakes in Maine 100 miles southeast into Passamaquoddy Bay. It is navigable to Calais, about 10 miles.

SAINT CROIX RIVER. A river forming part of the boundary between Minnesota and Wisconsin (Map: Wisconsin, A 3). It rises in Lake St. Croix, on the Lake Superior divide, and flows southwest and then south till it joins the Mississippi opposite Hastings, Minn. Its total length is 160 miles.

SAINT CUTHBERT DUCK. See EIDER.

SAINT CUTHBERT'S BEADS. See BEADS, SAINT CUTHBERT'S.

SAINT-CYR, săn′-sêr′, LAURENT GOUVION, MARQUIS DE (1764–1830). A marshal of France, born at Toul. In 1792 he volunteered in the Army of the Republic and served under Custine. Having been promoted to the grade of general of division in 1793, he took part in the campaigns on the Rhine and in Holland, whence in 1798 he was sent to Italy to succeed Masséna. There he quickly restored military discipline, and in 1800, after a brilliant campaign in Italy, he returned to Germany, became Moreau's lieutenant, and defeated Kray at Biberach. Napoleon sent him to Spain as Ambassador in 1801, and in 1803 made him commander of the army of occupation in Naples. In 1809 he lost the favor of Napoleon and resigned, but in 1812 he was given command of a corps in the army which invaded Russia, and after his great victory at Polotzk he was made marshal. He was captured at Dresden in 1813. During the Second Restoration, in 1815, he became Minister of War, and again in 1817, serving till 1819. His *Mémoires* were published at Paris (1821–31).

SAINT-CYR, MAISON DE. A once famous school for girls, founded in 1686 by Madame de Maintenon (q.v.) for the education of the daughters of the poor nobility and the children of dead or disabled officers. In 1692 the school was converted into a convent. Fénelon's *De l'éducation des filles*, published in 1687, influenced considerably the educational ideas at Saint-Cyr. The establishment of this institution marks the beginning of the emancipation of women's education. Madame de Maintenon personally supervised the institution from 1686 to 1717, and sometimes even taught there. The notoriety the school attained on account of the successful performances of a number of plays under the direction of Racine and Boileau had a demoralizing effect on the discipline of the school and undoubtedly influenced the founder in changing her liberal policy. It ceased to exist in 1793, when it was converted into a military hospital and later into the famous military school. See SAINT-CYR-L'ECOLE.

SAINT-CYRAN, săn′-sē′răn′. See DUVERGIER DE HAURANNE.

SAINT-CYR-L'ÉCOLE, săn′-sēr′-lā′kōl′. A village in the Department of Seine-et-Oise, France, 4 miles by rail west of Versailles. It is noted for the Ecole Spéciale Militaire de Saint-Cyr, which was transferred here in 1806 from Fontainebleau by Napoleon and is the leading military training establishment in France, attended by from 700 to 800 pupils and furnishing the army with 400 officers annually. Pop., 1901, 4253; 1911, 4756.

SAINT DA'VID'S. A city in Pembrokeshire, Wales, on the Allan, 1 mile from its mouth, on the north side of St. Bride's Bay (Map: Wales, A 5). The Norman cathedral, founded in 1180 on the site of the monastery of St. David and restored 1862–78, is the most important and interesting church in Wales. The extensive remains of the episcopal palace dating from 1347 are archæologically unique. The town has been the seat of a bishopric since 519. It was several times pillaged and burned by the Danes and others during the ninth and two following centuries; in the Middle Ages it was a large city, the great resort of pilgrims to St. David's shrine. Pop., 1911, 3245.

SAINT DAVID'S ISLAND. One of the Bermuda Islands (q.v.).

SAINT-DENIS, săn′-*de*-nē′. The name of an arrondissement and a suburb (north) of Paris, Metropolitan Department of Seine, France, 2 miles from the city (Map: Paris and Vicinity). It is defended by a fort on the east and ramparts on the north. The town is traversed by the Croud and Rouillon. Its history centres around the basilica of Saint-Denis, built in the seventh century as the church of an abbey by Dagobert I, on the site of the chapel raised above the grave of Saint-Denis, the first Bishop of Paris, about 275 A.D. Dagobert was buried in the church, which became the mausoleum of the kings of France. The edifice was rebuilt in the twelfth century. By decree of the National Convention of 1793 the abbey was ordered to be destroyed, the royal tombs were demolished, and the bodies removed. The building was much damaged. Restored under Napoleon I and succeeding governments, it is now considered one of the finest of Gothic monuments. The restored royal monuments, the high and other altars, the lofty nave lighted by 37 handsomely blazoned windows, the elegant triforium, and the radiating choir chapels are among its chief features. Adjoining the church is the extensive national Maison d'Education de la Légion d'Honneur, founded by Napoleon I for the free education of the daughters and other female relatives of officers of the Legion of Honor. There are cotton mills, dye works, bleacheries, chemical works, and flour mills. The yearly market, at which there is an annual sale of about 180,000 sheep, is one of the oldest in France and lasts for a fortnight. Pop., 1911, 71,549.

SAINT-DENIS. The capital of the French island of Réunion (q.v.), situated on the northwestern coast (Map: Africa, K 7). It has an exposed roadstead and contains a museum, a theatre, and barracks. Pop., 1912, 23,972, chiefly French creoles.

SAINT-DENIS SUGER, Abbé de. See Suger.

SAINT-DENYS, Marquis d'Hervey de. See Hervey de Saint-Denys, Marquis d'.

SAINT-DIÉ, -dyā′. An episcopal city and the capital of an arrondissement in the Department of Vosges, France, 31 miles southeast of Lunéville, on the Meurthe River (Map: France, N., M 4). The cathedral, dating from the eleventh century, is a composite of Gothic and Romanesque. Other features of the city include an eighth-century Romanesque church, the Canons' House, dating from 1557, the seventeenth-century episcopal palace, the museum, public library, the monument to Jules Ferry, born at Saint-Dié, and the park, extending along the bank of the river. Saint-Dié has important lumber interests and is also engaged in weaving and the manufacture of hosiery, tiling, etc. A monastery was established here in the sixth century by Saint Deodatus, from whom the city derives its name. Saint-Dié was captured but later evacuated by the Germans in the Great War which began in 1914. (See War in Europe.) Pop., 1901, 21,482; 1911, 22,136.

SAINT DISTAFF'S DAY. See Distaff's Day, Saint.

SAINT-DIZIER, -dē′zyā′. A town in the Department of Haute-Marne, 58 miles northeast of Troyes, on the Marne River and on the Marne-et-Saône Canal (Map: France, N., K 4). It has a college, a museum, and a public library. Industrially the town ranks very high. It is especially noted for its extensive iron and steel manufactures and large lumber interests. Shipbuilding is also a prominent industry. Pop., 1901, 14,601; 1911, 14,761.

SAINTE AGATHE, săNt ȧ′gȧt′. A village of Terrebonne County, Quebec, Canada, situated on Lac des Sables and on the Canadian Pacific, 63 miles northwest of Montreal (Map: Quebec, F 5). It is a popular winter and summer resort. Pop., 1901, 1073; 1911, 2020.

SAINTE-ALDEGONDE, săNt′-ȧl′*de*-gôNd′, Philip von Marnix, Baron. A Flemish statesman. See Marnix.

SAINTE ANNE DE BEAUPRÉ, *Fr. pron.* săNt ăn *de* bō′prā′. A village and celebrated pilgrim resort of Montmorency County, Quebec, Canada, at the confluence of the Ste. Anne River with the St. Lawrence River, on the north bank (Map: Quebec, K 4). It is connected with Quebec, 21 miles to the southwest, by the Quebec Railway, Light and Power Company Railway. The church of Ste. Anne is a fine building; it dates from 1876 and was created a basilica by papal decree in 1887. It contains relics of Ste. Anne which have reputed miraculous powers. The shrine is visited by thousands of pilgrims annually. Ste. Anne was founded about 1620 by Breton mariners; the ancient church, dating from 1658, rebuilt and restored in 1878, is an interesting edifice near the modern basilica. The picturesque Falls of Ste. Anne (130 feet high), the Falls of St. Féréol, and the Ste. Anne Mountains (2685 feet high) are prominent features in the neighborhood. Pop., 1911, 2066.

SAINTE ANNE DE BELLEVUE, bĕl′vụ′. A town in Jacques Cartier County, Quebec, Canada, on the Ottawa River and on the Grand Trunk and Canadian Pacific railways, 20 miles southwest of Montreal by rail (Map: Quebec, G 6). It is the seat of the Macdonald College of Agriculture and of a Roman Catholic college and convent. It is a summer resort. Pop., 1911, 1416.

SAINTE ANNE DE LA POCATIERE, lȧ pō′kȧ′tyâr′. A town in Kamouraska County, Quebec, Canada, on the south shore of the St. Lawrence River and on the Intercolonial Rail-

way (Map: Quebec, L 4). It is the seat of a Roman Catholic college and convent. An experimental farm is located here. Pop., 1901, 2434; 1911, 2412.

SAINTE-BEUVE, sănt'-bĕv', CHARLES AUGUSTIN (1804–69). A French critic and essayist. He was born at Boulogne-sur-Mer, Dec. 23, 1804. He was educated at Boulogne and at the Collège Charlemagne in Paris, studied medicine (1824–27), and served in the St. Louis Hospital (1828). Beginning in 1824, he contributed literary articles, the *Premiers lundis* of his collected *Works*, to the *Globe* newspaper, and in 1827 he came, through a review of Hugo's *Odes et ballades*, into close relations with that poet and the Cénacle (q.v.). As a justification of the Romantic movement he published in 1828 a *Tableau de la poésie française au XVIème siècle* and in 1829 and 1830 two volumes of subtle and ingenious though rather morbid poetry, the *Vie et poésies de Joseph Delorme* and the *Consolations*. He contributed also, in 1830, to the *Revue de Paris*, the first of his famous literary *Causeries*. The revolution of 1830 brought him under new influences. Religious questionings were fostered by intimacy with Lamennais, and his unrest is witnessed by his solitary novel, *Volupté* (1834), and by his lectures on *Port-Royal*, delivered at Lausanne (1837) and expanded during the next 20 years into five volumes (1840–60), of which the first and second show sympathy with Jansenism and the latter three the objectivity of an unbiased critic. At Lausanne, under the cherished influence of Vinet, Sainte-Beuve wrote his last volume of verse, the *Pensées d'août*. Then a visit to Italy clarified his mind, and from 1840 he appears wholly master of himself, as a "naturalist of minds." An appointment as keeper of the Mazarin Library (1840) secured him scholarly leisure, and for eight years he contributed regularly literary studies to the *Revue des Deux Mondes*. In 1845 he was elected to the French Academy, and during the turmoil of 1848 he lectured at Liége on *Chateaubriand et son groupe littéraire* (1860). In 1849 he returned to Paris and began his series of Monday chats (*Causeries du lundi*) in the *Constitutionnel*. These are collected in 28 volumes, 15 of *Causeries du lundi* and 13 of *Nouveaux lundis*. Longer studies in the reviews are gathered under the titles *Critiques et portraits*, *Portraits contemporains*, and *Portraits de femmes*. When Louis Napoleon became Emperor he made Sainte-Beuve professor of Latin poetry at the Collège de France, but anti-Imperialist students hissed him and he resigned. He was made Senator in 1865 and, although a partisan of Napoleon III, distinguished himself by his pleas for freedom of speech and of the press. He was in his last years an acute sufferer and lived much in retirement. Sainte-Beuve had vast knowledge, wonderful tact, and acute perception of what was vital and significant in his subjects. The mere bulk of his work (53 volumes) is imposing, and when we consider its precision, subtlety, and delicacy, the whole stands alone in the literature of criticism. A selection of the *Causeries* in English appeared as *English Portraits* (New York, 1875) and another as *Essays on Men and Women* (London, 1890); also translation by E. J. Trechmann (8 vols., New York, 1909–11).

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SAINTE CHAPELLE, sănt shå'pĕl'. A chapel or oratory built to receive relics of peculiar sanctity. The name is, however, commonly used to designate in particular the Sainte Chapelle du Palais at Paris, erected 1242–47 within the precincts of the royal palace (now the Palais de Justice) to serve at once as the chapel royal and as a depository for the crown of thorns and fragments of the true cross, brought from Jerusalem by Louis IX, at whose expense it was built. The architect was the celebrated Pierre de Montreuil (see MONTREUIL) or de Montereau; and this, his master work, is justly regarded as one of the most consummate products of mediæval architecture. The extraordinary rapidity of its construction resulted in a remarkable unity of style not found in Gothic buildings whose erection occupied long periods. Its execution is marvelously refined and perfect. It consists of a lower or basement chapel, 24 feet high, and the main or upper chapel, preceded by a superb open porch, vaulted likewise in two stories. The upper or main floor was on the level of the main floor of the palace, with which the upper porch communicated. The length over all is 135 feet, with a height of 128 feet to the ridge of the roof, above which rises a slender (modern) spire. The upper chapel is internally 105 feet long, 33 feet wide, and 64 feet high to the ridge of the vault; it is without columns and terminates in a polygonal apse, in which once stood the shrine of the relics. The superb vault is carried and abutted by deep buttresses between thĕ magnificent traceried windows 50 feet high, filled with the most gorgeous stained glass; the effect is extraordinary in its sumptuousness of color and boldness of design. The exterior is no less remarkable in exemplifying the perfection of French Gothic construction and carving in the middle of the thirteenth century. The rose window is of a later date. Other *saintes chapelles* were at Saint-Germain, Vincennes, and the abbey of Saint-Germain-des-Prés. Consult E. E. Viollet-le-Duc, "Chapelle," "Chapelles Saintes" in *Dictionnaire raisonné de l'architecture* (Paris, 1858–68), and De Cloux and Doury, *La Sainte Chapelle* (ib., 1865).

SAINTE-CLAIRE DEVILLE, sănt'-klâr' de-vêl', HENRI ETIENNE (1818–81). A French chemist, born at St. Thomas, West Indies. He received his education in France. From 1845 to 1851 he was professor of chemistry and dean of the faculty of sciences established by himself at Besançon. In 1851 he was appointed professor of chemistry at the Ecole Normale and in 1859 also at the Sorbonne, in Paris. His chief work in theoretical chemistry consisted in a series of researches on the phenomena of what he termed dissociation, a peculiar and important class of physicochemical

reactions, the study of which has contributed greatly to our knowledge of the mechanism of reactions in general. By a simple apparatus of his own invention he succeeded in measuring the dissociation of carbonic-acid gas, sulphur dioxide, and hydrochloric-acid gas. See DISSOCIATION.

Deville founded two important industries, viz., the aluminium and the magnesium industries. In 1854 he rediscovered independently and showed how to apply on a large scale Wöhler's method by which metallic aluminium is isolated by decomposing its chloride with metallic potassium; instead of potassium Deville employed the cheaper metal sodium, in the industrial production of which he introduced highly valuable improvements. Ingots of aluminium were exhibited by him, for the first time, at the Paris Exposition of 1855. By applying Wöhler's principle to magnesium he succeeded, jointly with Caron, in producing this metal, likewise, on a large industrial scale. His researches on the metallurgy of platinum, carried out in conjunction with Debray, have also proved of the highest importance. Further, he will be remembered as the discoverer of toluene (q.v.) and of the anhydride of nitric acid. Deville wrote *De l'aluminium, ses propriétés, etc.* (1859); *Métallurgie du platine* (2 vols., 1863), jointly with Debray; etc. Consult Jules Gay, *Henri Sainte-Claire Deville, sa vie et ses travaux* (Paris, 1889).

SAINTE CROIX, krwä. The largest of the Danish West India Islands. See SANTA CRUZ.

SAINT EDMUND HALL. The only remaining hall or hostel of Oxford University. It is said to have derived its name from St. Edmund, Archbishop of Canterbury in the reign of Henry III, and to have been founded in 1226. At the dissolution of the monasteries it came into the possession of Queen's College (1557), and since 1559 the perpetual right of nominating its principal has been vested in that society by an act of congregation. The foundation consists of a principal and a vice principal. There are 10 exhibitions attached to the hall for students designed for holy orders. The buildings, dating from the seventeenth century, adjoin those of Queen's College, and the undergraduates of St. Edmund are admitted to lectures in Queen's.

SAINT EDMUNDSBURY, ĕd'mŭnz-bĕr'ĭ. See BURY SAINT EDMUNDS.

SAINTE HÉLÈNE, sănt' ā'lĕn', SIEUR DE. See LE MOYNE, JACQUES.

SAINT ELIAS, sânt ē-lī'as, MOUNT. One of the highest peaks of North America, being exceeded only by Mount McKinley, 20,300 feet, and the neighboring Mount Logan, 19,500 feet. It is situated on the narrowest portion of Alaska Territory (Map: Alaska, L 5). Its height is 18,024 feet. The south slope is covered with glaciers extending to the seashore—Malaspina Glacier with an area of 1200 square miles faces the sea for 60 miles—and is exceedingly steep, almost precipitous. The northern or landward slope is more accessible. In 1897 Prince Luigi of Savoy made the ascent to the summit. The mountain itself is almost destitute of vegetation and covered with ice and snow. It is formed by the faulting of a portion of the earth's crust.

SAINTE LIGUE, sănt' lēg'. See HOLY LEAGUE.

SAINT ELIZABETH, ORDER OF. A Bavarian order of benevolence for women, founded in 1766 for noble Catholics. The membership is unrestricted, but candidates must show noble descent for four generations.

SAINT ELMO'S FIRE. See ELMO'S FIRE, SAINT.

SAINTE-MARGUERITE, sănt'-mär'ge-rēt'. An island of the Mediterranean. See LÉRINS, ISLES DE.

SAINTE-MARIE-AUX-MINES, sănt'-mâ'rē'-ô-mēn'. The French name of Markirch (q.v.).

SAINTE-MAURE, sănt'-mōr', CHARLES DE. See MONTAUSIER, MARQUIS DE.

SAINTE-MESME, sănt'-mām', MARQUIS DE. See L'HÔPITAL, G. F. A. DE.

SAINTES, sănt. The capital of an arrondissement in the Department of Charente-Inférieure, France, 27 miles southeast of Rochefort, on the Charente River (Map: France, S., D 3). It is noted for its many interesting remains of the period of Roman occupation. Among these the Amphitheatre and the Arch of Germanicus are the most prominent. The church of St. Eutropius, originally dating from the sixth century, was remodeled in the sixteenth. It has a large, handsomely embellished crypt. Other important features of the town are the church of St. Marie des Dames, dating from 1047, the courthouse, the town hall, with its library, and the hospital. Iron and copper working and the manufacture of farm implements are the leading industries. Pop., 1901, 18,219; 1911, 20,802.

Saintes, the ancient Mediolanum, was the chief city of the Santones before it passed into the hands of the Romans. The town was the capital of the old Province of Saintonge.

SAINTES, LES, lā sănt'. See GUADELOUPE.

SAINTE THERESE, tā'rēs'. A village in Terrebonne County, Quebec, Canada, situated on the Canadian Pacific Railway, 15 miles west by north of Montreal by rail (Map: Quebec, G 6). Pop., 1911, 2120.

SAINT-ÉTIENNE, săn'tā'tyĕn'. The capital of the Department of Loire, France, and one of the most important industrial centres of south France. It is situated on the Furens, a tributary of the Loire, 36 miles southwest of Lyons by rail (Map: France, S., J 3). It is essentially a manufacturing city and, with the exception of the church of Sainte Marie, the palace of justice, and the town hall, contains no buildings of architectural merit. Owing to its situation in one of the richest coal regions of south France and the abundance of water power furnished by the Furens, Saint-Etienne has developed very rapidly and its industrial importance is constantly increasing. The chief manufactures are firearms and the national factory alone employs normally in the neighborhood of 14,000 persons. Outside of firearms, small iron and steel products, and agricultural implements, Saint-Etienne is famous for its extensive ribbon factories, the product of which is exported all over the world and is regarded as the best of its kind. The coal mines in the vicinity of the city have an output of over 4,000,000 tons. The city has a fine school of mining, a lycée, a college, and a Palais des Arts containing a number of museums, among which the industrial museum, with its numerous samples of local manufactures, is the most interesting. Pop., 1901, 146,559; 1911, 148,656.

SAINT EUSTACHE ISLAND. An island of the West Indies. See EUSTATIUS ISLAND.

SAINT-ÉVREMOND, săn′tā′vrə-môn′, Charles de Marguetel de Saint-Denis, Seigneur de (1613–1703). A French critic and philosophical writer. He was born at Saint-Denis-le-Guast, was trained by the Jesuits, entered the army and served in Italy (1629) and Germany for the greater part of the Thirty Years' War. He was a friend of Condé and in philosophy a follower of Gassendi. Though a stanch Royalist, he was exiled, without sufficient apparent cause, after the fall of Fouquet (1661). He went to Holland and then to England, where Charles II pensioned him. On the fall of James II he declined an invitation to return to France, and made his home with the niece of Mazarin, Hortense Mancini. He died in London and was buried in Westminster Abbey. As a refined philosophical essayist and a master of French prose, worthy to be classed with Pascal and Voltaire, he has received, especially in the last century, increasing attention and appreciation. In his lifetime he published nothing, but circulated his work in manuscript, whence some of it found a side door to publicity in 1668. His *Œuvres* appeared in three volumes (London, 1705), with a memoir by Des Maizeaux, and have often been reëdited, perhaps best by Giraud (Paris, 1865). Consult: Gidel, *Etude sur Saint-Evremond* (Paris, 1866); Gustave Merlet, *Saint-Evremond: étude historique, etc.* (ib., 1870); C. A. Sainte-Beuve, *Causeries de lundi*, vol. iv, English translation by E. J. Trechmann (New York, 1910).

SAINT FERDINAND, Order of. 1. A Sicilian order of merit, founded in 1800 by King Ferdinand IV and abolished in 1861. 2. A Spanish military order, with five classes, founded by the Cortes in 1811 and renewed in 1815 by King Ferdinand VII. Connected with it are pensions ranging from 400 to 40,000 reals. The decoration for the first and third classes is a white eight-pointed cross, bearing the image of St. Ferdinand, surrounded by a blue band and the inscription *Al mérito militar.* The second and fourth classes bear the same decoration resting on a laurel wreath.

SAINT-FLOUR, săn′-flo͝or′. The capital of an arrondissement in the Department of Cantal, France, 52 miles south of Clermont-Ferrand (Map: France, S., H 3). The town is built at an altitude of 2895 feet above sea level, on the edge of a plateau which rises sheer several hundred feet from a valley of the Cantal mountains. It has manufactures of pottery and coarse cloth. Pop., 1901, 5634; 1911, 5777.

SAINT-FOND, Barthélemy Faujas de. See Faujas de Saint-Fond, Barthélemy.

SAINT FRAN'CIS RIVER. A tributary of the Mississippi. It rises near Iron Mountain in southeast Missouri and flows south into Arkansas, forming for a short distance the boundary between the two States (Map: Arkansas, E 1, 2). It empties into the Mississippi near Helena after a course of 450 miles. The greater part of its course winds through a low, swampy country interlaced with bayous, and for about 70 miles the river expands into a lake from 1 to 5 miles wide. This serves as an important reservoir during the floods of the Mississippi. The river is navigable for 150 miles.

SAINT FRANCIS XAVIER, zăv'ĭ-ĕr. The high school of a Roman Catholic institution in New York City, formerly the College of St. Francis Xavier, founded in 1847. It is conducted by the fathers of the Society of Jesus and is intended for day scholars only. The college department in 1913 was transferred to Brooklyn College, Brooklyn, N. Y., and gives degrees under the title of the College of St. Francis Xavier, New York. The high school has a library of about 130,000 volumes, and there were, in 1915, 395 students. The faculty numbered 16. Military instruction is given.

SAINT GABRIEL, Brothers of. See Gabriel, Brothers of Saint.

SAINT-GALL, *Fr. pron.* săn′-gàl′ (Ger. *Sankt Gallen*). A canton of northeast Switzerland, bounded on the north by the Canton of Thurgau and Lake Constance, on the east by the Rhine, which separates it from Vorarlberg, Liechtenstein, and Grisons, on the south by Grisons and Glarus, and on the west by Schwyz and Zurich (Map: Switzerland, D 1). It incloses entirely the Canton of Appenzell and covers an area of 779 square miles. The north is hilly, while the south belongs to the region of the western Alps, the Ringelspitz, near the southern frontier, reaching an altitude of over 10,500 feet. The canton belongs to the basin of the Rhine and its principal river is the Thur.

The climate varies in accordance with the conformation of the surface and is somewhat raw in the mountainous parts. Considering its uneven surface, Saint-Gall is a very productive region, over 65 per cent of its total area being under tillage, gardens, and meadows. Still the domestic supply of agricultural products is insufficient to meet the demand, owing to the density of the population. The grape and other fruits are cultivated in the valley of the Rhine and in the northern part. Saint-Gall is among the industrial cantons of Switzerland and produces chiefly cotton goods and embroideries.

The constitution of the canton provides for a legislative assembly (*Grosser Rat*), the members of which are elected by the communes at the rate of one member for every 1500 inhabitants, and an executive council of seven members elected by the people. The referendum is in force. Pop., 1910, 301,141. Over one-half of the inhabitants are Roman Catholics, and the German language is spoken by a large majority of the population.

SAINT-GALL (Ger. *Sankt Gallen*). The capital of the Canton of Saint-Gall and one of the most important manufacturing centres of Switzerland, situated at an altitude of nearly 2000 feet, about 50 miles east of Zurich and about 12 miles from Lake Constance (Map: Switzerland, D 1). It consists of the irregular old town on a hill and the new quarters in the valley of the Steinach. The Roman Catholic cathedral, formerly an abbey church, is a rococo building dating chiefly from the middle of the eighteenth century. The Benedictine abbey was founded early in the seventh century by St. Gallus, an Irish monk, and was one of the most famous seats of learning in Europe during the ninth and tenth centuries. The eighteenth-century building is now used by the cantonal government. Its celebrated library contains about 41,000 volumes, including nearly 1600 incunabula and a number of valuable manuscripts. Among the educational institutions of the city are a cantonal school, a town library with valuable manuscripts of the Reformation period, the museum of the East Swiss Geographical-Commercial Society, the museum of natural history, and the collection of the art society.

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AUGUSTUS SAINT-GAUDENS

"THE SHAW MEMORIAL," BOSTON, MASS.

Saint-Gall is the centre of an extensive industrial region famous for its embroideries and white goods, which are exported all over the world. Pop., 1910, 37,657. German is spoken by most of the inhabitants. In the eleventh century the town acquired considerable independence and, assisted by Imperial privileges and its growing economic importance, it succeeded in obtaining complete independence from its abbots in the middle of the fifteenth century and joined the Swiss Confederacy. The abbey was abolished at the introduction of the Reformation into Saint-Gall in 1529, but was restored in 1532 and finally abolished in 1805. In 1803 the Canton of Saint-Gall was constituted in the reorganized Swiss Confederacy.

SAINT-GAUDENS, sânt-gâ′denz, AUGUSTUS (1848–1907). One of the foremost American sculptors. He was born in Dublin, Ireland, March 1, 1848, of French and Irish parentage, but the family came to New York City when Augustus was six months old. At 13 he was apprenticed to a cameo cutter, and for six years he worked at this craft—a long training which had much to do with the delicacy of his later work, particularly in his fine feeling for relief. At the same time he attended the art school of Cooper Union and life classes at the Academy of Design. In 1867 Saint-Gaudens went to Paris and entered the atelier of Jouffroy in the Ecole des Beaux-Arts. He was intimately associated with the sculptors Dubois, Mercié, Falguière, and Saint-Marceaux, and identified with the current movement in French sculpture, which found inspiration in the Italian Renaissance rather than in classic work. In 1870 he went to Rome, where he executed the statues "Hiawatha" and "Silence," and in 1873 he returned to America. As the first American sculptor equipped with complete French training he attracted wide attention. His first important public work, destroyed by fire in 1904, was the decoration of the chancel of St. Thomas's Church in New York City, the chief feature of which was a large cross surrounded by panels of kneeling angels. During this period Saint-Gaudens modeled many portraits in low relief. In 1878 he was appointed member of the international jury at the Paris Exposition. The same year he was commissioned to execute the important monument of Admiral Farragut in Madison Square, exhibited at the Salon in 1880, and the monument of Governor Randall at Sailors' Snug Harbor, Staten Island. The Farragut monument, the base of which was designed with the coöperation of the architect Stanford White, embodying, better perhaps than any other of his works, all Saint-Gaudens's best personal and artistic qualities, immediately placed him in the front rank of American sculptors. The pedestal, an entirely original departure, was equally successful, the entire field of sculpture containing few things finer than the two figures here carved in extremely low relief. In simple dignity of conception, subtle combination of the real and the ideal, quiet strength, and intensely human appeal, the "Lincoln," unveiled in Chicago in 1887, is still deservedly considered the finest portrait statue in the United States. Other important achievements of this period are the memorials to Dr. Bellows (1885) and Dr. McCosh (1889), at Princeton; the statue "Deacon Chapin" (1887), in Springfield, Mass., a most convincing embodiment of austere Puritanism; the sturdy bronze statue of Peter Cooper (1897), in front of Cooper Union, New York; and the Robert Gould Shaw (q.v.) Memorial (1884–97), on Boston Common, a large bronze relief, considered by some critics Saint-Gaudens's masterpiece and certainly one of the most notable relief sculptures of the century (see Plate). Other public monuments are the Garfield Monument (1895, in Fairmount Park, Philadelphia), the martial "General Logan" in Chicago, and, most important, the bronze equestrian statue of General Sherman preceded by the figure of Victory, at the Fifth Avenue and 59th Street entrance to Central Park, New York (1903). Not quite completed at his death was a statue of Phillips Brooks, for the grounds of Trinity Church, Boston.

In his ideal figures, replete with fine poetic feeling, Saint-Gaudens was particularly successful. Among the most notable are the beautiful caryatides of a mantelpiece in the residence of W. K. Vanderbilt, New York; the "Amor Caritas" (1887, Luxembourg Gallery, Paris); the three angels for the tomb of Governor Morgan, Hartford, Conn., since destroyed by fire; the rarely beautiful "Peace of God" (1891), in Rock Creek Cemetery, Washington; and the bronze "Diana" (1892), his only nude figure, surmounting the tower of Madison Square Garden, New York. Saint-Gaudens, who in the refined and charming use of low relief stands preëminent among his countrymen, executed numerous portrait plaques in this medium, the most important being the well-known tributes to his friends Bastien Le Page and Robert Louis Stevenson (St. Giles's Cathedral, Edinburgh), portraits of William D. Howells and his daughter, of Mrs. Schuyler van Rensselaer, Charles F. McKim, F. D. Millet, Richard Watson Gilder, the children of Jacob Schiff, and the children of Cornelius Vanderbilt. The most influential figure in the development of American sculpture, especially as regards relief, Saint-Gaudens was a member of the National Academy of Design and one of the seven original members of the American Academy of Arts and Letters, an Officer of the Legion of Honor, an honorary LL.D. of Harvard University and L.H.D. of Princeton. He received medals at Paris in 1900 and Buffalo in 1901 and the gold medal of the National Institute of Arts and Letters. Saint-Gaudens died at Cornish, N. H., Aug. 3, 1907. Memorial exhibitions of his works were held in 1908 in the Metropolitan Museum, New York, and elsewhere. Consult Royal Cortissoz, *Augustus Saint-Gaudens* (New York, 1907); Paul Clemen, in *Die Kunst für alle* (Munich, 1910); *Reminiscences of Augustus Saint-Gaudens* (2 vols., New York, 1913), edited and amplified by his son, Homer Saint-Gaudens; also Lorado Taft, *History of American Sculpture* (ib., 1905); *Catalogue of a Memorial Exhibition of the Works of Augustus Saint-Gaudens, at the Metropolitan Museum* (ib., 1908).

SAINT-GELAIS, săN′-zhe-lâ′, MELLIN DE (1487–1558). A French poet, the most important member of the school of Clément Marot, noted among his contemporaries as a court singer and a skillful master of language. He was educated mainly at Bologna and Padua and, on returning to France, took orders and received various valuable preferments. His work, though considerable in volume, is mainly composed of very short pieces, epigrams, rondeaux, and the like, composed in a fluent and

graceful style. His works were edited by Blanchemain (Paris, 1873).

SAINT GEORGE. One of the Bermuda Islands (q.v.).

SAINT GEORGE, Cape. See Cape Saint George.

SAINT GEORGE, Constantinian Order of. An order of Parma and Sicily, probably established by the Byzantine Emperor Isaac II Angelus about 1190, under the name of the Order of Constantine. The order remained in the family of the Angeli until it was transferred to Duke Giovanni Francesco Farnese of Parma in 1697. When Don Carlos came into possession of Parma and later of Naples, the order was reorganized and called after St. George. The order was finally dissolved in 1860, when Sicily and Parma were incorporated with Italy. The decoration is a red cross of lilies, bearing the image of St. George and the dragon, the initial of the name of Christ and the letters I H S V, and A and Ω. The Sicilian order had three classes, the Parmesan six. Consult Rhodokanaki, *The Imperial Constantinian Order of St. George* (London, 1870).

SAINT GEORGE, Mountain of. See Lycabettus.

SAINT GEORGE, Order of. 1. A Bavarian order with six classes, established in 1729 and reorganized by King Louis II in 1871, with the King as grand master. The candidate for admission to the order must show eight generations of nobility on both sides. The decoration is an eight-pointed cross bearing the image of the Virgin and the letters V. I. B. I. (Virgini Immaculatæ Bavaria Immaculata). On the reverse is the image of St. George with the letters I. V. P. F. (Justus ut Palma Florebit).

2. A Russian military order with four classes, founded in 1769 by the Empress Catharine II and confined to officers having at least the rank of colonel. The decoration is a white Maltese cross, edged with gold, bearing an image of St. George and the dragon, and suspended from an orange and black ribbon. See Plate of Orders.

3. A Hanoverian order, established in 1839 by King Ernest Augustus and dissolved in 1866. The device was "Numquam Retrorsum."

4. A Sicilian military order of merit, founded in 1808. It was dissolved in 1861.

5. The original name of the English Order of the Garter. See Garter, Order of the; and Plate of Orders.

SAINT GEORGE'S CHANNEL. A strait connecting the Irish Sea with the Atlantic and separating southern Ireland from Wales (Map: England, A 4). It varies from 60 to about 100 miles in width, is about 100 miles long from northeast to southwest, and has channel depths ranging from 300 to 500 feet.

SAINT-GERMAIN, săn'-zhĕr'măn', Count of. An eighteenth-century charlatan of European reputation. His origin and life history are unknown. He pretended to be thousands of years old, laid claim to miraculous powers, and surrounded himself with an air of mystery which, added to his magnificent style of living, fine manners, and agreeable presence, gained him, after 1740, tremendous notoriety in an age that delighted in the mysteries of mesmerism and Freemasonry. He first appeared in Parisian society about 1770. Consult Oettinger, *Graf Saint-Germain* (Leipzig, 1846).

SAINT-GERMAIN-EN-LAYE, ăn'-lā'. A town in the Department of Seine-et-Oise, France, 11 miles west of Paris, on the Seine River (Map: France, N., G 4). It is a popular summer resort. A handsome terrace, built in 1672, overlooks the Seine. The forest of Saint-Germain is a magnificent park, covering an area of 11,000 acres. In the restored sixteenth-century royal castle are a splendid museum of Gallo-Roman antiquities and a chapel dating from 1240. The town hall has a library and an art gallery. Saint-Germain was at one time the summer home of the French court. Pop., 1901, 17,297; 1911, 17,977. See Huguenots.

SAINT GILES, sânt jīlz, **CRIPPLEGATE.** One of the most notable and historic churches of London, the burial place of John Foxe, the author of the *Book of Martyrs*, the explorer Frobisher, and Milton. The church was built in 1545 and was among the few buildings spared by the great fire of London.

SAINT GOTTHARD, *Fr. pron.* săn gŏ'tär'. A mountain group in the Lepontine Alps, situated in south-central Switzerland, on the boundary between the cantons of Valais, Uri, and Ticino (Map: Switzerland, C 2). It is a rugged mass of granite and gneiss, reaching in Pizzo Rotondo an altitude of 10,489 feet. St. Gotthard is famous for the pass over the Alps, 6936 feet high, connecting Flüelen, on Lake Lucerne, with Lake Maggiore, in the north of Italy. The road over the pass, constructed between 1820 and 1832, is one of the best and most convenient of the Alpine carriageways and is free from snow for four or five months of the year. It is remarkable for the grandeur of its scenery, but has, however, been little used since the opening of the railroad. In 1869 and 1871 Germany, Italy, and Switzerland signed an agreement for the construction of a railway with a tunnel through the St. Gotthard, which makes Genoa a port for western Germany, and for this reason Italy and Germany contributed largely to its construction, although the whole of the line is in Swiss territory. The tunnel was begun in 1872 and completed in 1881 at a cost of about $13,000,000. It is 9¼ miles long, 26 feet wide, 21 feet high, and reaches an elevation in the centre of 3786 feet. The approach to the tunnel is remarkable because of the three loop tunnels on the north and two on the south. Consult Spitteler, *Der Gotthard* (Frauenfeld, 1897).

SAINT HELE'NA. An insular possession of Great Britain, situated in the Atlantic Ocean, in lat. 15° 55′ S. and long. 5° 42′ W., about 1200 miles west of Africa and about 800 miles southeast of the island of Ascension, the nearest land (Map: Africa, D 6). Area, 47 square miles. The island is of volcanic origin and its surface is rugged and mountainous, reaching an altitude of about 2700 feet in the High Hills in the southwest. The coasts are lined with high cliffs, varying in altitude from 600 to 2000 feet. The climate is moderate and healthful and the mean annual temperature is somewhat over 70°. The forests have almost disappeared.

The present economic importance of the island is insignificant, its commercial importance having greatly decreased since the construction of the Suez Canal. Potatoes and flax are the principal products. The island is a crown colony and is administered by a governor and a council. The majority of the inhabitants are of mixed East Indian, European, and African descent. In 1901 they numbered 3342; in 1911, 3520. In the former year there were also 4650 Boer prisoners.

of war and 1428 members of the garrison. The garrison was withdrawn in 1906. St. Helena is connected by cable with Europe and South Africa and is an Admiralty coaling station. The capital and only town is Jamestown in the northwest, a fortified port with an observatory and a population (1911) of 1439.

St. Helena was discovered May 21, 1502, by a Portuguese navigator, João da Nova. It was uninhabited, and about 1645 was settled by the Dutch. In 1651 it passed to the British East India Company, but was retaken by the Dutch on several occasions. The island owes its fame to the fact that it was from 1815 to 1821 the place of exile of Napoleon, who died there on May 5, 1821, in the farmhouse of Longwood, about 3 miles from Jamestown. Consult J. C. Melliss, *St. Helena: A Physical, Historical, and Topographical Description of the Island* (London, 1875), and E. L. Jackson, *St. Helena: The Historic Island from its Discovery to the Present Day* (ib., 1909).

SAINT HEL'EN'S. A manufacturing town in Lancashire, England, on an affluent of the Mersey, 193 miles northwest of London (Map: England, D 3). The town is of modern origin and was incorporated in 1868. It owns its markets, abattoirs, water, gas, electric lighting, tramways, dust destructors, and sewage farm. There are several parks, notably the Victoria, which contains a museum, and the town has a fine town hall, public libraries, and a technical school. St. Helen's carries on an extensive trade in coal and has plate-glass, copper, bottle, patent-medicine, and other works. There are collieries and deposits of stoneware, clay, and fire clay. Pop., 1901, 84,410; 1911, 96,566.

SAINT HELENS, Baron. See Fitzherbert, Alleyne.

SAINT HÉLIER, *Fr. pron.* săn'tă'lyā'; now usually written without accent and pronounced as English, sânt hĕl'yĕr, or **SAINT HELIER'S.** The capital of Jersey, Channel Islands (qq.v.), a seaport and favorite watering place on the south shore of the island and on the east side of St. Aubin's Bay (Map: France, N., C 3). It has an active English and foreign shipping trade, fisheries, iron foundries, perfume manufactories, etc. The town is well built and granite paved and has fine markets, esplanades, marine walks, bathing places, aquarium, and parks. Victoria College, the Maison St. Louis or Jesuit College, with its meteorological observatory and wind tower, the fourteenth-century parish church, the modern Roman Catholic church, hospital, town hall, state house, and public library are the chief buildings. The town is defended by Elizabeth Castle, on a rocky island in the middle of the harbor, and on the southeast by Fort Regent, a large modern fortress recently built at the cost of some $5,000,000. Pop., 1901, 27,866; 1911, 30,125.

SAINT HEN'RY, Order of. A Saxon military order founded in 1736 by Augustus III, King of Poland and Elector of Saxony. It had originally one class, which was increased to three in 1807. The decoration, a gold and white cross of eight points, surmounted by a crown, bears a central medallion with the effigy of Emperor Henry II on a yellow ground, encircled by a blue band with the words "Frid. Aug. D. G. Rex Sax. Instauravit." The reverse shows the Saxon arms with the legend *Virtuti in Bello.*

SAINT HER'MENGILD, Order of. A Spanish order of merit with three classes, founded in 1814 by Ferdinand VII. The order is conferred for land and sea service, the first class on generals and naval commanders, the second on officers below the rank of brigadier, the third on officers of at least 10 years' standing after service of 25 years. The decoration is an eight-pointed cross of white enamel with a circular medallion bearing the effigy of St. Hermengild on a blue ground, with the inscription *Premio á la constancia militar.*

SAINT-HILAIRE, săn'tē'lâr', Augustin François César (Prouvençal de) (1779–1853). One of the most eminent of French botanists, born at Orléans, France. He was a member of a wealthy French family and was trained by his father for a business career. In 1816 he sailed for Brazil, where he spent six years in exploration and botanical research, and in 1819 he was elected a correspondent of the Institute. In 1822 he returned to France with one of the most valuable collections of natural-history specimens ever to that time gathered. His elaborate work on the flora of Brazil was published in three volumes in 1825, under the title *Flora Brasiliæ Meridionalis, ou histoire et description de toutes les plantes qui croissent dans les différentes provinces du Brésil.* Meanwhile he had become professor of botany in the Faculty of Sciences at Paris, and in 1830, on the death of Lamarck, succeeded him as a member of the Institute. His botanical investigations resulted in several discoveries of great value, including two entirely new families, the Paronychiæ and the Tamariscineæ; the difference between the aril and the arilode; and the direction of the radicule in the embryonic sac. In addition to his work on the flora of Brazil he published *Aperçu d'un voyage dans l'intérieur du Brésil* (1823); *Histoire des plantes les plus remarquables du Brésil et du Paraguay* (1824–26); *Mémoire sur le système d'agriculture adopté par les Brésiliens* (2 vols., 1827); *Voyage dans les provinces de Rio de Janeiro et Minas Geraes* (1830); *Voyage dans le district des diamants et sur le littoral du Brésil* (2 vols., 1833); *Voyage aux sources du San Francisco et dans la province de Goyaz* (2 vols., 1847); *Voyage dans les provinces de Saint Paul et de Sainte Catherine* (1851); *Leçons de botanique, comprenant principalement la morphologie végétale* (1840–41). For a complete list of his works up to 1830, consult J. M. Guérard, *La France littéraire,* vol. x (Paris, 1836).

SAINT-HILAIRE, Geoffroy. See Geoffroy Saint-Hilaire.

SAINT-HILAIRE, Jules Barthélemy. See Barthélemy Saint-Hilaire.

SAINT HILAIRE METHOD. See Navigation.

SAINT HU'BERT, Order of. The highest Bavarian order, founded in 1444 by Gerhardt V and originally called the Order of the Horn, from the hunting horns which formed the links of the chain. The order has but one class, composed of an unrestricted number of members of princely rank, with not more than 12 members of lower grade. The decoration is a white cross with eight points tipped with golden balls. Three golden rays separate the arms of the cross, which is surmounted by a crown. The medallion represents the conversion of St. Hubert, with the Gothic inscription *In trav vast* (Firm in faith) on a red band.

SAINT HY'ACINTHE, *Fr. pron.* săNt ē'ă'săNt'. A city, port of entry, and the capital of St. Hyacinthe County, Quebec, Canada, on the

Yamaska River and the Grand Trunk, the Canadian Pacific, the Intercolonial, and the Quebec, Montreal, and Southern railways, 35 miles east-northeast of Montreal (Map: Quebec, H 6). It is the seat of a Roman Catholic bishop and contains a city hall, St. Hyacinthe College, a seminary, and monasteries of the Precious Blood and Dominican Fathers. There are manufactures of leather, organs, tools, boots and shoes, woolen goods, hosiery, woodenware, spinning wheels, biscuits, gloves, corsets, shirts, and farming implements. Pop., 1901, 9210; 1911, 9797; 1915 (civic census), 11,544.

SAINT IGNA'TIUS' BEANS. The seeds of *Strychnos ignatii*, a shrub or small tree of the family Loganiaceæ, a native of Cochin-China and the Philippine Islands. The fruit, which is about the size of a large pear, contains about 20 brownish seeds about as large as olives, rounded on one side and somewhat angular on the other, which have been used like nux-vomica seeds. See STRYCHNOS.

SAINT IGNATIUS COLLEGE, now **LOYOLA UNIVERSITY.** A Roman Catholic institution founded in 1870 in Chicago under the former name and conducted by the fathers of the Society of Jesus. The corporate name was changed in 1909 to Loyola University. The university includes the departments of law, engineering, medicine, pharmacy, sociology, department of arts and sciences (St. Ignatius College). It conducts two high-school departments in Chicago, St. Ignatius Academy and Loyola Academy. The total number of students enrolled in all departments in 1915 was 1495, with 137 instructors in the teaching faculty. The university confers the usual degrees appropriated to the various departments. There is no endowment. The professors in St. Ignatius College and in both academies, being members of religious orders whose object is teaching, serve without salary. The library contains about 40,000 volumes. The president in 1915 was Rev. John Mathery, S.J.

SAINTIN, săn'tăn', JULES EMILE (1829–94). A French genre and portrait painter. He was born at Lemé (Aisne) and studied in Paris under Drolling, Picot, and Leboucher. Afterward he spent a number of years in the United States and some of his works are inspired by American subjects. He painted numerous portraits in oil, crayon, and pastel, and domestic and idyllic pictures in an agreeable but somewhat crude and conventional manner. His portraits include those of Paul Morphy (1860), Stephen Douglas (1860), the Princess Mathilde and Madame Carnot (1891). He was elected an associate of the National Academy of Design in 1861 and to the Legion of Honor.

SAINTINE, săn'tĕn', XAVIER. The name assumed by JOSEPH FRANÇOIS BONIFACE (1798–1865), a mediocre French novelist, collaborator in some 200 plays and author of *Picciola* (1837), which won him the Montyon prize from the Academy.

SAINT ISABELLA, ĭz'ă-bĕl'lă, ORDER OF. A Portuguese order founded in 1801 by the Prince Regent (King John IV). It consists of 26 ladies, nominated by the Queen. Its chief object is the supervision of the care of the sick and orphans. The decoration is a golden medallion surmounted by a crown and surrounded by golden roses and ribbons. It bears the image of St. Isabella of Portugal and the device *Pauperum Solatio.*

SAINT IVES. A seaport and market town in Cornwall, England, on St. Ives Bay, on the Bristol Channel, 57 miles west-southwest of Plymouth (Map: England, A 6). It is a favorite bathing and winter resort, owing to its mild climate, and is a picturesque town; its church, a granite building of the early part of the fifteenth century, stands on the beach. The town was incorporated in 1639. It is the headquarters of the pilchard fishery. Pop., 1901, 6700; 1911, 7179. Consult Matthews, *St. Ives* (St. Ives, 1884).

SAINT-JACOB, săn'-zhă'kŏ'. A hamlet in Switzerland, situated a mile south of Basel and noted as the scene of a great battle in 1444 between the Swiss and the Armagnacs (q.v.) (Map: Switzerland, B 1).

SAINT JAMES OF THE SWORD. 1. A military order of Spain, established during the reign of Ferdinand II of León and Galicia, about the year 1170, and confirmed by Pope Alexander III in 1175. (See COMPOSTELLA.) The insignia of the order is a golden shield bearing a broad cruciform sword in red. 2. A Portuguese order (Saõ Thiago da Espada) established as an offshoot of the Spanish order about 1290 and sanctioned by a papal bull in 1320. The order attained exceeding prosperity and in 1566 was united with the crown. It was secularized in 1789 and made a civil and military order of merit. It was reorganized in 1862, to be conferred thenceforth for distinguished merit in science, art, and literature. 3. A Brazilian order established on the removal of the Portuguese royal family to Brazil in 1808. It was secularized in 1843 and suspended in 1890.

SAINT JAMES'S COFFEEHOUSE. A former noted resort on St. James's Street, London, a Whig gathering place during the eighteenth century. Swift, Goldsmith, Garrick, and Johnson were among its patrons. It was removed about 1806.

SAINT JAMES'S PALACE. The London residence of the British sovereigns, from William III to the accession of Victoria, and now used for levees and drawing rooms. The Court of St. James's is still the official designation of the British court. It is a large inelegant brick structure fronting on Pall Mall. Originally a hospital dedicated to St. James, it was reconstructed and made a manor by Henry VIII, who added a park to it, which he inclosed with a brick wall, to connect St. James's with Whitehall, then the royal residence. Additions and improvements gradually changed the original palace, so that only the red brick Tudor front of the old structure remains. In 1837 the royal household was transferred to Buckingham Palace. St. James's Park lies south of the palace and extends over 87 acres. Consult Edgar Sheppard, *Memorials of St. James's Palace* (2 vols., London, 1894).

SAINT JAN'UA'RIUS, ORDER OF. An order of knighthood founded in 1738 by Charles III, King of the Two Sicilies, as a reward for service in the defense of the Roman Catholic church and fidelity towards the sovereign. It became extinct in 1861 on the union of Sicily with the Italian crown.

SAINT-JEAN D'ACRE, săn'-zhăn' dăk'r'. A seaport of Syria. See ACRE.

SAINT-JEAN-D'ANGELY, dăn'zhă'lê'. The capital of an arrondissement in the Department of Charente-Inférieure, 30 miles south of Niort, on the Boutonne River (Map: France, S., D 3).

Its chief objects of interest are the ruins of the old abbey and the thirteenth-century church. Pop., 1901, 7041; 1911, 7060. The town grew up around a Benedictine abbey, which the Calvinists destroyed in 1568. It was a Protestant stronghold until its capture by Louis XIII in 1619.

SAINT JEROME, zhā'rōm'. A town and the county seat of Terrebonne County, Quebec, Canada, on Rivière du Nord and on the Canadian Pacific and Canadian Northern railways, 30 miles by rail northwest of Montreal (Map: Quebec, F 6). Its manufactures include dairy products, paper, shoes, etc. Pop., 1901, 3619; 1911, 3473.

SAINT JEROME DE MATANE, săn jĕ'rôme' de' mà'tän'. A village in Rimouski County, Quebec, Canada, situated on the south shore of the St. Lawrence River, at the mouth of the Matane River. Pop., 1911, 2056.

SAINT JOHN. The chief town of the British West Indian island of Antigua and capital of the Leeward group, situated on the west side of the island at the end of a somewhat shallow bay (Map: West Indies, G 3). It is well built and has several fine public buildings. A bar at the mouth of the harbor makes it inaccessible for heavier vessels. Pop., 1911, 9262.

SAINT JOHN. A city, seaport, and county seat of St. John County, New Brunswick, Canada, at the mouth of the St. John River, on the Bay of Fundy and on the Intercolonial, the Canadian Pacific, and the New Brunswick Southern railroads, 120 miles (direct) west-northwest of Halifax (Map: New Brunswick, D 6). The harbor is one of the best on the continent; the entrance is protected by Partridge Island, on which are a lighthouse and a quarantine hospital. The channel is protected on the east by a breakwater. The city is built on a rocky peninsula. A steel cantilever railroad bridge and a highway suspension bridge span the river gorge. St. John is celebrated for its Reversing Falls, caused by the entrance of the river St. John into the harbor through a narrow gorge. Among the public buildings are the Court House and Jail, the Provincial Insane Asylum, Market House, Post Office, City Hospital, City Hall, two public libraries, Sailors' Home, Wiggins Orphan Asylum for Sailors' Sons, Armory, Protestant and Roman Catholic orphan asylums, Home for Incurables, Masonic and Odd Fellows' halls, and Home for Aged Females. The city has over 500 acres in parks and public gardens. St. John has recently become the winter port of Canada. Its new docks are of large size. It is the terminus of the Canadian Pacific. The chief articles of export are lumber and grain, but there is also an important trade in fish, furs, and agricultural produce. Its shipping ranks third on Canada's official register. It has a total annual trade of $35,000,000. The industrial establishments include grain elevators, saw mills, a large sugar refinery, rolling mills, foundries, engine and boiler works, cotton mills, woodworking factories, marble works, etc. The manufactured output of 1910 amounted in value to $10,081,667. On Jan. 24, 1604, the feast day of St. John the Baptist, whence its name, the Micmac Indian settlement here was first visited by Champlain and De Monts. St. John became a permanent European settlement in 1635. In 1758 it was taken by an Anglo-American force, although it had become a British possession under the Treaty of Utrecht in 1713. Its modern growth dates from 1783, when it received an immigration of 10,000 United Empire loyalists. Its charter of incorporation (1785) is the oldest in Canada. Pop., 1901, 40,711; 1911, 42,511.

ST. JOHN, sānt jŏn *or* sĭn'jĭn, HENRY. An English statesman. See BOLINGBROKE, VISCOUNT.

ST. JOHN, sānt jŏn *or* sĭn'jĭn, JAMES AUGUSTUS (1801–75). A British author and traveler, born in Carmarthenshire, Wales. He went to London in 1817, edited a Plymouth radical paper, in 1824 was appointed subeditor of J. S. Buckingham's *Oriental Herald*, in 1827, with David Lester Richardson, started the *Weekly Review*, and in 1829 removed to Normandy. He traveled extensively in Egypt and Nubia. Among his numerous works, comprising travel, fiction, and biography, are the following: *Egypt and Mohammed Ali* (1834); *Manners and Customs of Ancient Greece* (1842); *Egypt and Nubia* (1845); *Isis: An Egyptian Pilgrimage* (1853); *The Nemesis of Power* (1854); *There and Back Again in Search of Beauty* (1853); *Philosophy at the Foot of the Cross* (1854); *History of the Four Conquests of England* (1862); *Life of Sir Walter Raleigh* (1868).

ST. JOHN, JOHN PIERCE (1833–1916). An American political leader and prohibitionist, born at Brookville, Ind. He enlisted in the Federal army in 1862, becoming a lieutenant colonel. At the close of the war he removed to Missouri and in 1869 settled at Olathe, Kans. He was elected Governor of Kansas in 1879. At the expiration of his term in 1883 he accepted the nomination for President on the Prohibition ticket and polled 151,809 votes. Later, however, he became more radical in his economic views than the majority of his party and in 1900 supported Bryan for President.

SAINT JOHN, LAKE. A large lake, about 25 miles across, in the Province of Quebec, Canada, situated about 100 miles north by west of Quebec (Map: Quebec, H 3). It receives several large streams from the north and empties through the Saguenay (q.v.). It is encircled by wooded hills, is much resorted to by sportsmen, and is the centre of an important and fairly populous dairy region.

ST. JOHN, OLIVER (c.1598–1673). An English judge. He was educated at Queens' College, Cambridge, and in 1626 became a barrister at Lincoln's Inn. Associated with Lord Saye, John Pym, John Hampden, and Oliver Cromwell, he married a cousin of the last named. He was Solicitor-General in 1641–43, but supported the bill for Strafford's attainder. Throughout the Civil War he supported Cromwell and was one of the commissioners to treat for peace at Uxbridge in 1645. Appointed Chief Justice of Common Pleas in 1648, he refused to act as commissioner at the trial of Charles I. He published *Case of Oliver St. John* (1660) to account for his conduct during the Revolution.

SAINT JOHN, REVELATION OF. See REVELATION OF SAINT JOHN.

SAINT JOHN LATERAN, CHURCH OF. See LATERAN, CHURCH AND PALACE.

SAINT JOHN OF JERUSALEM, KNIGHTS OF. A military and religious order, known also as the Hospitalers, Knights of the Hospital, Knights of Rhodes, and Knights of Malta. Its origin is obscure and great antiquity has been claimed for the order. One or more of the hospices which were established in the Holy Land by Pope Gregory the Great may have existed until the time of the First Crusade and may thus have given rise to this order. The special

hospital at Jerusalem from which it took its name was either founded or restored by merchants from Amalfi in 1070 or earlier. For some years the brethren were under the rule of St. Benedict and were engaged strictly in hospital duties. After the capture of Jerusalem by the Crusaders in 1099, a hospital in honor of St. John the Baptist was founded in Jerusalem and became the cradle of the later order. The earliest authentic documents which can be dated belong to the years 1099 and 1100. The first head of the brotherhood whose name has been preserved was Gerard, who died probably in 1120. Under his administration the brethren followed the rule of St. Augustine. His successor was Raymond de Puy, who changed the hospital brotherhood into a military order and ruled as master until 1158. It is not certain that the order was sanctioned in 1118, 1120, or 1130, as has been generally stated by the older writers; but in 1153 Pope Eugenius III confirmed the privileges which had been accorded by Paschal II, Calixtus II, Honorius II, and Innocent II. This confirmation proves that the order had been recognized earlier.

The brothers were of three classes: knights, who were of noble birth; priests or almoners; and brethren, who were not nobles, but who were fighting men. Most of the members were French. They had to take the three monastic vows of poverty, chastity, and obedience. Their main duty was to aid in the defense of the Holy Land, and during the twelfth century the Hospitalers and Templars (q.v.) were the chief defense of the Kingdom of Jerusalem. They vied with the Templars in wealth and ambition. After the destruction of the Order of the Templars they succeeded to much of its wealth. There were at least 12 commanderies of the Hospitalers in Syria, and branches were gradually established in the countries of western Europe. The earliest was in France and dates from the first years of the twelfth century. The house of the Hospitalers at Prague dates from 1159. In all their possessions in Europe were divided into eight *langues*, or provinces, but some of these were not established until the fourteenth and fifteenth centuries. Their head was known at first as master and later as grand master. The final form, which is now followed, was given to the order by the grand master Pierre d'Aubusson (q.v.) in 1489. The order maintained its headquarters in Syria until 1290, when, on account of the rapid conquests of the Mohammedans, it was removed to Cyprus. The seat of the order was in Cyprus from 1290 to 1310 and in Rhodes from 1310 to 1522. Then it passed successively to Crete, Messina, Baiæ, Viterbo, and in 1530 to Malta, which was ceded to the order by Charles V of the Holy Roman Empire. Next to Pierre d'Aubusson the most celebrated head of the order was Jean de la Valette, grand master from 1557 to 1568, who defended Malta successfully against the forces of Sultan Soliman II (1565). During all of these centuries and in fact until the close of the eighteenth century, the knights still continued to fight against the infidel and still remained wealthy and famous. In 1798 the island of Malta was seized by Napoleon, whereupon the knights chose Paul I of Russia as their grand master, counting on his aid against the French. Paul did enter into hostilities with France, and Malta was occupied by the English in 1800; the island has remained an English possession. In 1801 the election of a grand master was vested in the Pope, who chose Bailli Tommasi. The latter made his seat at Catania, and the order at once lost its political, social, and military importance. After the death of Tommasi in 1805, no new grand master was chosen until 1879, when Leo XIII reëstablished the dignity and fixed the headquarters of the order at Rome. In the interval the order had been governed by lieutenants and by a general council meeting at Rome. Since 1879 the members have entered into hospital service, under the Convention of Geneva. They have business offices in London, near St. John's Gate, a relic of their old priory, and in other capitals. Their dress is a black gown with a white cross. The seal of the order has always represented the brethren attending a sick person. The archives of the general order, going back to the twelfth century, are still in existence at Valletta, Malta.

Bibliography. The most important single work is the *Cartulaire général de l'ordre des hospitaliers*, 1100 to 1310 (Paris, 1894–1901), edited by Delaville le Roulx. Of this work three volumes and the first part of volume iv have appeared. Consult also: Abbé de Vertot, *Histoire des chevaliers hospitaliers de Saint-Jean de Jérusalem* (Amsterdam, 1757); E. G. Rey, *Colonies franques de Syrie aux 12me et 13me siècles* (Paris, 1883); F. de Salles, *Annales de l'ordre de Malte* (Vienna, 1889); W. K. P. Bedford, *Malta and the Knights Hospitallers* (New York, 1894); Archer and Kingsford, *The Crusades* (ib., 1898).

SAINT JOHN RIVER. The principal river of New Brunswick, Canada. It rises on the boundary between Maine and Quebec and flows first northeast through north Maine, then eastward on the boundary between Maine and New Brunswick, and finally southeast through the latter province till it empties into the Bay of Fundy at St. John (Map: New Brunswick, A 2). Its length is about 500 miles and it receives several large tributaries, such as the Allegash and Aroostook, which drain most of the lakes of north Maine. The upper course of the river still passes through a wild and sparsely inhabited timber region. Shortly after entering Canadian territory it plunges in the Grand Falls over a perpendicular rock 75 feet high. For the last 100 miles the river is wide, crooked, beset with islands, and possesses many baylike tributaries, as Grand Lake and Belleisle Bay. Immediately before entering St. John harbor in the Bay of Fundy this expansion contracts into a narrow, rocky gorge 400 feet wide with a fall of 17 feet, presenting very peculiar tide phenomena. At low tide the river above the gorge is 12 feet higher than the level of the harbor, but at high tide it is 5 feet lower, so that the rapids are reversed with every turn of the tide, and vessels can pass through the gorge only during a short period between ebb and flood. The river is navigable for steamers of considerable size 80 miles to Fredericton, the tidal limit, for smaller steamers to Woodstock, 145 miles, and at high water to the Grand Falls, 225 miles. Above the falls it is again navigable 40 miles for small steamers. By the Ashburton Treaty its navigation was made free to citizens of the United States.

SAINT JOHN RIVER. A river of Quebec, Canada. See RICHELIEU.

SAINT JOHN'S. A town and the capital of St. John's County, Quebec, Canada, on the Riche-

lieu River and on the Grand Trunk, Central Vermont, Canadian Pacific, and Delaware and Hudson railways, 27 miles south by east of Montreal (Map: Quebec, G 6). It is connected by bridge with Iberville. The manufactures include sewer pipe, pottery, silk, straw hats, furniture, wax tapers, umbrellas, etc. Pop., 1901, 4030; 1911, 5903.

SAINT JOHN'S. The capital of Newfoundland, on the east side of the peninsula of Avalon, on the Atlantic Ocean and the Newfoundland Railway (Map: Newfoundland, H 5). The city is built principally north of the harbor. The north and south sides are connected by a causeway and bridges. The Roman Catholic cathedral stands on the top of the hill above the city, 225 feet above the sea; there is also an Anglican cathedral. There are St. Bonaventure College (Roman Catholic) and Anglican, Methodist, and Presbyterian colleges. Conspicuous public buildings are the government house, the Parliament buildings, the public hospital, market house, courthouse, customhouse, and post office. The water supply is brought 4 miles, from Windsor Lake.

The entrance to the landlocked harbor, visible only at close range when approached from the sea, is marked by the Narrows, 2160 feet across outside, 570 feet at the narrowest point from Chain Rock to Pancake Rock. On the north side of the Narrows is a cliff of sandstone and slate rock 300 feet high, and above that towers Signal Hill, 510 feet above the level of the sea. On the south side of the Narrows there is South Side Hill, 650 feet high, on which is a lighthouse called Fort Amherst. Cape Spear and Fort Amherst lights give guidance to vessels entering the excellent harbor. Around the harbor are substantially built stores, warehouses, and wharves, a dry dock, 610 feet long, with full repair facilities, as well as a floating dry dock for vessels of under 600 tons burden and a marine railway. St. John's receives the bulk of the imports of the colony and has an important trade in clothing, fishermen's and hunters' outfits, and provisions. Its capitalists are mostly nonresident. The manufactures are principally ship bread, nets, iron, boots and shoes, furniture, etc. It has distilleries, block and rope factories, oil refineries, breweries, and tanneries. Business connected with the fisheries absorbs general attention; there are large exports of seal, cod, and oil. The city is governed by a board of commissioners appointed by the Governor in Council. It was founded in 1582 by Sir Humphrey Gilbert, captured by Iberville (q.v.) in 1696 and again during the Seven Years' War (q.v.), but finally reverted to Britain by the Treaty of Paris in 1763. A fire in 1892 destroyed $16,000,000 worth of property. Pop., 1901, 29,594; 1911, 32,292.

SAINT JOHNS. A city and the county seat of Clinton Co., Mich., 22 miles north of Lansing, on the Grand Trunk Railroad (Map: Michigan, E 5). It is mainly a residential place and has a ladies' library and a fine union school building. St. Johns is noted for its manufactures of portable houses, sashes, doors, and blinds. There are four grain elevators and manufactories of gasoline engines, agricultural implements, etc. Pop., 1900, 3388; 1910, 3154.

SAINT JOHN'S BREAD. The locust tree. See CAROB.

SAINT JOHNSBURY. A village and the county seat of Caledonia Co., Vt., 34 miles east by north of Montpelier, on the Passumpsic River and on the Boston and Maine, the Maine Central, and the St. Johnsbury and Lake Champlain railroads (Map: Vermont, E 3). It has the St. Johnsbury Academy, Fairbanks Museum, an art gallery, two hospitals, and a large public library. At St. Johnsbury are the works of the Fairbanks Scale Company, machine shops and foundries, furniture factories, grain elevators, and manufactories of steam hammers, hoes, forks, and other agricultural implements. The village is also an important trade centre for a large agricultural and live-stock region. The government is vested in a board of village trustees. Pop., 1900, 5666; 1910, 6693.

SAINT JOHN'S CHRISTIANS. See MANDÆANS.

SAINT JOHN'S COLLEGE. A college at Cambridge, England. It was founded in 1511 by Lady Margaret Beaufort, Countess of Richmond and Derby, mother of Henry VII. The college succeeded to the site and buildings of a hospital of St. John, founded by Henry Frost in 1135. St. John's is the second college of Cambridge in size and importance. The foundation consists of a master, 57 fellows, 60 scholars, and 9 so-called "proper" sizars. There are about 250 undergraduates in all. The college buildings are extensive and of great beauty. The library contains about 40,000 volumes, numerous pamphlets, and over 1000 manuscripts. Consult J. B. Mullinger, *St. John's College* (London, 1901).

SAINT JOHN'S COLLEGE. A college at Oxford, England. It owes its origin to Archbishop Chichele, founder of All Souls College (q.v.), who converted a house of Bernardine monks into St. Bernard's College in 1536. At the dissolution of the monasteries Henry VIII gave this college to Christ Church College, which in turn transferred it to Sir Thomas White. He established on this foundation in 1555 the present college, dedicated to the study of sacred theology, philosophy, and the good arts, and he is therefore its real founder. The college was largely added to by the generosity of Laud (q.v.), who was for a time its president. It consists of a president, 16 fellows, a number of honorary fellows, lecturers, and tutors, 56 scholars and exhibitioners, a number from the Merchant Taylors' School, and some 220 undergraduates in all. Consult W. H. Hutton, *St. John Baptist College* (London, 1898).

SAINT JOHN'S COLLEGE. An institution for higher education, chartered at Annapolis, Md., in 1784 and opened for students in 1789. It was developed from the King William's School established in 1696. The buildings are valued at $250,000. The college curriculum includes three courses, classical, Latin scientific, and scientific, leading to the degrees of A.B. and S.B. There are also a subfreshmen class and a premedical course. There is a military department, which is unusually efficient. The annual income amounts to about $50,000. The attendance in 1915 was about 200. There were 13 members of the faculty. In the college library are about 10,000 volumes. The president in 1915 was Thomas Fell, Ph.D., LL.D.

SAINT JOHN'S COLLEGE. See FORDHAM UNIVERSITY.

SAINT JOHN'S EVE. The night before the festival of St. John Baptist (June 24), or Midsummer Eve. It seems to have been ob-

served with similar rites in every country of Europe. Fires were kindled chiefly in the streets and market places of the towns; sometimes they were blessed by the parish priest and prayer and praise offered until they had burned out; but as a rule they were secular in their character and conducted by the laity themselves. The young people leaped over the flames or threw flowers and garlands into them, with merry shoutings; songs and dances were also a frequent accompaniment. Probably the festival was of heathen origin and possibly connected with the worship of the sun. Consult J. G. Frazer, "Balder the Beautiful," in *The Golden Bough* (3d ed., London, 1913). For popular customs, consult Robert Chambers, *Book of Days* (new ed., 2 vols., Philadelphia, 1911). See BELTANE.

SAINT JOHN'S RIVER. The principal river of Florida. It rises in the swamps of Brevard and Osceola counties and flows northward, roughly parallel with, and 20 miles from, the Atlantic coast (Map: Florida, E 1). It empties into the Atlantic Ocean 25 miles south of the Georgia boundary. From its source downward it passes through a chain of lakes, the largest of which is Lake George. From that lake to its mouth, about 200 miles, the river expands into the form of a lagoon from 1 to 5 miles wide. A channel is kept open by means of jetties through the bar at the mouth, and the river has been dredged to a depth of 18 feet to Jacksonville, about 20 miles. There is a depth of 8 feet as far as Lake George, while small steamers ply regularly as far as Enterprise, 230 miles, and may ascend beyond.

SAINT JOHN'S TOWN. See PERTH (Scotland).

SAINT JOHNS'VILLE. A village in Montgomery Co., N. Y., 31 miles east of Utica, on the State Barge Canal and on the New York Central Railroad (Map: New York, F 5). It has a condensed-milk plant, knitting mills, piano works, and a gasoline-engine and thresher factory. Pop., 1900, 1873; 1910, 2536.

SAINT JOHN THE DIVINE, CATHEDRAL OF. The Protestant Episcopal cathedral of the diocese of New York, situated on the Morningside ridge in upper Manhattan. The movement for its erection, though begun in 1872, bore little fruit until about 1889, when it was strongly promoted by Bishop Henry C. Potter (q.v.). In 1890, as the result of a competition in which 30 architects participated, the design of Heins and La Farge (qq.v.) was adopted. This design, conceived on Byzantine lines internally but externally treated in a free Romanesque manner, was greatly modified in execution. In 1915 only the crypt (completed 1899), the vast choir with its ambulatory and chapels, and the four huge arches of the crossing (with a temporary domical roof and temporary walls) had been completed, at a cost, exclusive of that of the land and of the accessory buildings, of $3,615,000. The seven chapels—chapels of the seven tongues (of St. Saviour, St. Columba, St. Ambrose, St. Martin of Tours, St. Boniface, St. James, and St. Ansgarius)—are in various styles and by different architects. The half dome of the apse is carried by six colossal columns of granite from Hurricane Island, Me. (See Plate of CHOIR.) A magnificent organ and richly carved sedilia for the choir are features of the interior, the different parts of which display a disturbing variety of treatment, though individually some of them are of considerable beauty. New designs were prepared for the crossing, transepts, and west front by Ralph Adams Cram (q.v.), who was appointed supervising architect in 1911, after the retirement of Mr. La Farge, Mr. Heins having died in 1907. The present structure measures 360 feet over all in length; the central aisle of the choir is 50 feet wide in the clear and 130 feet high. The cathedral when completed will be one of the largest places of worship in the world, measuring over 600 feet in length, with transepts having a total spread of over 300 feet. In 1915 it was expected that work on the nave would soon be begun. The present cathedral group comprises, in addition to the cathedral itself, a number of important accessory buildings, in a well-handled Gothic style, predominantly French in spirit—the fine Synod Hall, the Bishop's House, and the Deanery, all by R. A. Cram; the Choir School by Cook and Welch; the Deaconess House by Heins and La Farge; and a beautiful open-air pulpit (modeled after the English town preaching cross) by Howells and Stokes. The entire group stands in a close of about 12 acres.

SAINT JOSEPH. A town in Canada. See LAUZON.

SAINT JOSEPH. A city and the county seat of Berrien Co., Mich., 60 miles by water east of Chicago, Ill., at the mouth of the St. Joseph River, on Lake Michigan and on the Pere Marquette, the Michigan Central, and the (traction) Interurban railroads (Map: Michigan, C 6). Two daily lines of passenger and freight steamboats connect with Chicago. St. Joseph is a popular summer resort. Among its features are the mineral bathhouses, Edgewater Club, Carnegie Library, Lake Front Park, and Silver Beach. There are also ironworks, paper mills, a door factory, knitting mills, and manufactories of boats, fruit baskets and fruit packages, engines, automobile tubes, air rifles, and flour. First settled in 1829, St. Joseph was incorporated as a village in 1836 and received a city charter in 1892. Pop., 1900, 5155; 1910, 5936.

SAINT JOSEPH. The third city of Missouri, a port of entry of the Michigan district, and the county seat of Buchanan County, on the Missouri River, 60 miles north of Kansas City and 132 miles south of Omaha, Neb. (Map: Missouri, B 2). Seven railroad systems afford excellent transportation facilities. They are the Atchison, Topeka, and Santa Fe, the Chicago, Burlington, and Quincy, the Chicago Great Western, the Chicago, Rock Island, and Pacific, the Missouri Pacific, the St. Joseph and Grand Island, and the Kansas City, Clay County, and St. Joseph. A steel railroad bridge 4270 feet long connects the city with its Kansas suburb, Elwood. St. Joseph is about 13 square miles in area, is built along the bluffs which lie close to the Missouri River, and has a splendid drainage system. The city has a river front of 3 miles. There are about 280 miles of streets, of which 82 miles are paved. Among the prominent features are Krug Park, Lake Contrary, the live-stock exchange, public auditorium, county courthouse, Home for Little Wanderers, Memorial Home for Aged People, Carnegie, Washington Park, and Public libraries, fine Y. M. C. A. and Y. W. C. A. buildings, a commodious country club, and four hospitals, Noyes, Ensworth, Methodist, and

Sisters of St. Joseph. State Hospital for Insane, No. 2, is situated here, as are also the Scottish Rite and St. Joseph cathedrals, a United States Weather observatory, and the State Fish Hatchery. Mount Mora Cemetery is of interest. Educational institutions include the Sacred Heart Academy, Christian Brothers' College, a number of parochial schools, two business colleges, a private school for girls, and 33 public schools, whose buildings are valued at $2,000,000. The latter house 370 teachers and 12,000 pupils.

St. Joseph is one of the greatest live-stock markets in the country, its immense yards and packing houses doing an annual business of about $66,000,000, with a daily capacity of 17,000 cattle, 29,000 hogs, 16,000 sheep, and 1000 horses and mules. As a jobbing and wholesale centre the city carries on annually trade valued at $100,000,000. The chief articles of commerce are dry goods, hardware, harness and saddlery, cotton garments, queen's ware, crockery, rice, millinery, boots and shoes, and tea. Large quantities of wheat, corn, oats, and hay are also shipped from here. Manufactured products in 1913 were valued at $21,347,961, representing an invested capital of $14,401,405, exclusive of the packing-house interests. Chief among the manufactures are milling products, candy, men's clothing, creamery products, shoes, biscuits, agricultural implements, trunks, glue, furniture, soap, woolen goods, foundry and machine-shop products, etc. Natural gas affords cheap fuel. St. Joseph has adopted the commission form of government. The city's expenditures for maintenance and operation in 1913 were $888,000. The chief items were $157,000 for fire department, $114,000 for police department, $66,000 for streets, and $387,000 for education. The assessed property valuation was $39,231,000 and the municipal debt $2,313,000. The city owns its lighting plant.

St. Joseph dates from 1826, when Joseph Robidoux, an Indian trader and trapper, opened a trading post a short distance above the present site of the city, at Roy's Branch. In 1830 he moved to the Blacksnake Hills, now in the heart of the city. The first post office was established in 1840 and in 1843 Blacksnake Hills had a population of 500. The plats of St. Joseph were recorded July 26, 1843, when the change in name took place. St. Joseph became the permanent county seat in 1846 and in 1853 a city. After the discovery of gold in California in 1849, the city was a prominent outfitting and starting point for miners; from there after 1860 ran the pony express. The first census of St. Joseph, taken in December, 1846, showed a population of 936. Its growth since the Civil War has been very rapid, the population in 1870 being 19,565; 1880, 32,431; 1890, 52,324; 1910, 77,403; 1915 (U. S. est.), 83,974; 1920, 77,939.

SAINT JOSEPH, Order of. A former grand-ducal order of Tuscany, founded in 1514 and extinguished in 1860. It had three classes and was restricted to persons of noble birth.

SAINT JOSEPH RIVER. A river of southwest Michigan. After making a detour into Indiana it flows northwest into Lake Michigan at the town St. Joseph (Map: Michigan, C 6). It is 250 miles long and navigable about 100 miles for small steamers.

SAINT-JUNIEN, săn'-zhu'nĕ'ăn'. A town of the Department of Haute-Vienne, France, on the right bank of the Vienne, 18 miles west-northwest of Limoges (Map: France, S., E 3). The beautiful twelfth-century abbey church contains a sculptured tomb of the patron saint from whom the town takes its name. Saint-Junien has a college. The manufactures of gloves and straw paper and the leather-dressing, felt, and clog factories are important. Near by are a large porcelain plant and slate quarries. Pop., 1901, 11,432; 1911, 11,379.

SAINT-JUST, zhust, Antoine (c.1767–94). A leader of the French Revolution, born at Decize in Nivernais. He was the son of a retired cavalry officer and was educated at Soissons by the Oratorians. He went to Rheims to study law, but soon devoted himself exclusively to literature. When the Revolution broke out Saint-Just was in Paris in connection with the publication of his poem *Organt*, and he was at once transported with republican enthusiasm. Later on he became a lieutenant colonel in the National Guard of his commune. In 1791 appeared his *Esprit de la révolution et de la constitution de la France*, in which the various causes of the Revolution were dealt with, and in the following year he was chosen deputy to the Convention by the electors of Aisne. He voted for the death of the King and became one of Robespierre's strongest supporters. In the fierce debates of this period Saint-Just took a leading part. After the fall of the Girondists in June, 1793, Saint-Just became more prominent than ever. He had been chosen a member of the Committee of Public Safety in April and on Feb. 19, 1794, he was elected president of the Convention. He drew up the report which led to the execution of Danton and his adherents. With Robespierre Saint-Just fell on the fateful 9th Thermidor and with him was guillotined on the following day, July 28, 1794. Consult Edouard Fleury, *Saint-Just et la Terreur* (2 vols., Paris, 1851), and Ernest Hamel, *Histoire de Saint-Just* (ib., 1859), both of which, however, are biased. One of the best brief accounts is that in F. A. Aulard, *Les orateurs de la législative et de la convention* (2 vols., Paris, 1885). Consult also Alfred Bégis, *Saint-Just* (Paris, 1892), and Kritshewsky, *J. J. Rousseau und Saint-Just* (Bern, 1895). A collection of the writings of Saint-Just has been published by C. Vellay, *Œuvres complètes de Saint-Just* (Paris, 1908).

SAINT-JUST, Emmanuel Marie Michel Philippe Fréteau de. See Fréteau de Saint-Just, E. M. M. P.

SAINT KITTS. One of the Leeward Islands. See Saint Christopher.

SAINT LAMBERT. A town in Chambly County, Quebec, Canada, on the St. Lawrence River, connected with Montreal by the Victoria Bridge (Map: Quebec, G 6). It possesses a Protestant and a Roman Catholic academy and a convent. Pop., 1911, 3344.

SAINT-LAM'BERT, Jean François (1716–1803). A French poet, born at Nancy. Madame du Châtelet and Madame d'Houdetot befriended him and helped him in his career as a soldier, and he was connected with the great *Encyclopédie* (q.v.). Besides his best work, *Les Saisons* (1769), he wrote: *Ode sur l'Eucharistie* (1732); *Recueil de poésies fugitives* (1759); *Le matin et le soir* (1764); *Les principes des mœurs chez toutes les nations, ou catéchisme universel* (1798). Saint-Lambert was elected to the Academy in 1770.

SAINT LAWRENCE. An island in Bering Sea, belonging to Alaska (Map: Alaska, D 4), about 150 miles south of Bering Strait. It is about 100 miles long by 10 to 30 wide. A mountainous region, its higher peaks approximate 2000 feet elevation. Its principal village is called Gambell. The population is almost entirely native Eskimo, numbering about 600. Reindeer were introduced in 1900 and now number nearly a thousand head. Bering discovered the island in 1728. Fifty years later it was visited by Captain Cook, who thought it comprised two islands, which he named St. Lawrence and Clark.

SAINT LAWRENCE, GULF OF. An inlet of the north Atlantic, bounded by the west shore of Newfoundland and the shores of the Canadian provinces of Quebec, New Brunswick, and Nova Scotia (Map: Canada, S 7). It has three communications with the ocean—the Strait of Belle Isle, between Newfoundland and Labrador; the Gut of Canso, between the island of Cape Breton and the peninsula of Nova Scotia; and Cabot Strait, 62 miles wide, with the island of St. Paul in the middle, between Cape Breton and Newfoundland. In the opposite direction it narrows at the west end of Anticosti into the estuary of the St. Lawrence River. Besides Anticosti, St. Paul, and Prince Edward the gulf contains several clusters of islands, more particularly in its southern half. The north shore, which is bold and rocky, is fringed with small islets. The waters are frequently rendered dangerous to shipping by thick fogs and uncertain currents. The gulf results largely from the submergence of the land in recent times, so that the passages from the ocean to the river are deep, the one through Cabot Strait being 1200 feet and the one through the Strait of Belle Isle 600 feet deep. The latter is the route taken by transatlantic steamers. The Gulf of St. Lawrence is celebrated for the productiveness of its fisheries.

SAINT LAWRENCE RIVER. A river of eastern North America (Map: Canada, R 7). Its basin includes the entire system of the Great Lakes, constituting the largest body of fresh water in the world. Its drainage area and rate of discharge, however, are much less than those of the Mississippi.

The name St. Lawrence River is usually confined to the outlet of Lake Ontario, flowing from the northeastern extremity of that lake in an almost straight northeast course of about 775 miles to the Gulf of St. Lawrence, an arm of the Atlantic Ocean. For a distance of 30 miles below Lake Ontario the river is from 4 to 10 miles wide, but this wide expanse is filled with a wilderness of beautiful rocky and wooded islands, known as the Thousand Islands, ranging in size from about 20 square miles to mere rocks bearing a few trees. Below this expansion the river maintains an average width of 1¾ miles as far as Quebec, narrowing in some places to less than a mile and widening in others into lakes nearly 10 miles wide. The fall of the river from Lake Ontario to Quebec is 240 feet, nearly the whole of which is accomplished above Montreal in a series of rapids separated by long reaches of quiet water. The upper rapids occur where the Laurentian spurs cross the river to form the Adirondacks; the lowest are the Lachine Rapids, just above Montreal harbor, where a line of igneous rock traverses the plains. From Montreal to Quebec the river passes between low banks through a wide, cultivated plain. Tidewater is reached at Three Rivers, about halfway between Montreal and Quebec, and at the latter city the spring tide rises 18½ feet, while salt water becomes noticeable 30 miles below. At Quebec begins the great estuary, which is 350 miles long and widens gradually from 10 miles below the island of Orleans to about 90 miles at the west end of Anticosti Island, where it enters the gulf. The south shore continues low some distance below Quebec. The north shore soon becomes high and bold, and towards the mouth of the estuary the south shore also is lined with high, rugged, and forest-covered mountains. The chief tributaries of the St. Lawrence proper are the Ottawa, which enters it from the north through several channels around the islands at Montreal and whose dark, amber-colored waters flow side by side with the light blue of the main stream until tidewater is reached; the Richelieu, the outlet of Lake Champlain, which enters the river from the south some distance below Montreal; and the Saguenay, flowing into the estuary. Instead of the river entering the ocean through a shallow and shifting delta, the valley of the St. Lawrence has been submerged through the sinking of the land, so that its entrance is about 90 miles wide and 1200 feet deep. Its drowned channel has been traced through the Gulf of St. Lawrence and out to the brink of the submerged continental escarpment some 200 miles east of Nova Scotia. A depth of 600 feet extends halfway to Quebec, and the river is 100 feet deep nearly or quite up to that city. Between Quebec and Montreal the natural depth is over 20 feet, and the channel has here been deepened so that the largest ocean steamers can pass up to the wharves at the latter city. Above Montreal the rapids are passed by a series of 9 canals with a total length of 42 miles and provided with locks, each of which is 45 feet wide and 270 feet long, with 14 feet of water on the sills. These canals, however, are used only on the upstream route; on the return trip even the passenger steamers descend the rapids. For the navigation above the St. Lawrence proper, see GREAT LAKES. Consult: Steckel, *Water Levels* (Ottawa, 1893); G. W. Browne, *St. Lawrence River* (New York, 1905); S. E. Dawson, *St. Lawrence: Its Basin and Borderlands* (ib., 1905).

SAINT LAZ'ARUS, ORDER OF. An order of chivalry founded in Palestine for the purpose of caring for sick pilgrims and transferred to Europe after the destruction of the Christian power. The chief seat of the order was at Boigny in France. It was merged in the Order of Our Lady of Mount Carmel, founded in 1807, and was thenceforward known as the Ordre militaire et hospitalier de St. Lazare et de Notre Dame du Mont Carmel réunis. It was dissolved in 1830.

ST. LEGER, sānt lĕj'ēr *or* sĭl'lĭn-jēr, BARRY (1737–89). A British soldier who fought in the American Revolution. He served under General Abercrombie, took part in the siege of Louisburg in 1758, and fought under Wolfe at Quebec. In 1777 St. Leger, then a lieutenant colonel, commanded an expedition which was to go up the St. Lawrence to Lake Ontario, land at Oswego, and, with the assistance of Sir John Johnson and the Indians, capture Fort Stanwix and then march down the Mohawk valley and

join General Burgoyne. On Aug. 3, 1777, St. Leger reached Fort Stanwix, and three days later fought the battle of Oriskany (q.v.) with a relief force under General Herkimer. On the 22d of the same month the approach of a second relief force under General Arnold produced such a panic among St. Leger's men that they retired in haste to Canada. St. Leger continued to serve in Canada and on the northern border of the Colonies, and in 1780 he was promoted colonel. He published *St. Leger's Journal of Occurrences in America* (London, 1780).

ST. LEONARDS, sānt lĕn'ērdz, EDWARD BURTENSHAW SUGDEN, BARON (1781–1875). An English lawyer, born in London. In 1802 he began the study of law and three years later became known by his *Practical Treatise of the Law of Vendors and Purchasers of Estates* (1805). He was called to the bar at Lincoln's Inn in 1807. He was returned to Parliament in 1828, was knighted and made Solicitor-General in 1829, and became Lord Chancellor of Ireland in 1835 and again from 1841 to 1846. He was appointed Lord Chancellor of England and raised to the peerage in 1852. He published many valuable legal treatises. Consult J. B. Atlay, *The Victorian Chancellors*, vol. ii (London, 1908).

SAINT-LÔ, săn'-lô'. The capital of the Department of Manche, France, 47 miles southeast of Cherbourg, on the Vire River (Map: France, N., D 3). The principal building is the Gothic church of Notre Dame, dating from the fourteenth century. It was remodeled in the seventeenth century. The town hall, museum, hall of justice, and prefecture are among the features of the town. Horse breeding is extensively carried on and there are manufactures of cloth, leather, etc. Pop., 1901, 11,604; 1911, 12,181. The industrial prominence of the town suffered severely through the Revocation of the Edict of Nantes.

SAINT-LOUIS, săn'-lōō'ē'. The capital of the French Colony of Senegal, situated on a small island in the delta of the Senegal, about 12 miles inland and 163 miles by rail northeast of Dakar (Map: Africa, C 3). It is a well-laid-out town, with a number of public buildings. The climate is extremely unhealthful. Extensive dredging operations have improved the port and there is a regular river service with Kayes, the former capital, 490 miles distant. The town was founded in 1626. The population, 23,305 in 1913, is extremely heterogeneous, but includes 1052 French.

SAINT LOUIS, sānt lōō'is *or* lōō'ē. The chief city of Missouri and of the States formed from the Louisiana Purchase of 1803; in population the fourth city of the United States and the principal city of the Mississippi valley (Map: Missouri, F 3). It is situated on the west bank of the Mississippi River, 709 miles from New Orleans and 599 miles from St. Paul, about 20 miles below the mouth of the Missouri and 124 miles above the mouth of the Ohio, in lat. 38° 38′ N., long. 90° 12′ W.

Description. The city, as originally founded, occupied a bluff of the St. Louis limestone, one of a series extending north and south along the west bank of the river, from which the land gradually rises westward in rolling hills. The lowlands of the Mississippi, known at this point as the American bottoms, are wholly on the east, or Illinois, side of the river. Although in the central part of the city the original bluffs have been graded away for convenience of access to the river, the city, now extended north and south beyond its original site, still enjoys the advantages of a limestone foundation. It has a river frontage of 19.15 miles, with a depth in a direct line to the extreme western limits of 6.6 miles. The area included within these limits is 61.37 square miles.

The original site of the city, now a small part of the business district, lay below the crest of a hill, not far from Broadway, the present north and south thoroughfare, which follows the general course of the river, at a minimum distance from it approximating one-eighth of a mile. The city lies within a curve of the river having a general easterly direction. The characteristics impressed on the city by its original French founders exist now only in a few streets between Broadway and the river, and even there, except in a few unchanged buildings, such as the Roman Catholic cathedral on Walnut Street, they are hardly to be detected. The streets are narrower than elsewhere in the city, and the buildings still used or formerly used for residences show the influence of the Colonial style of architecture.

The tendency of the modern city has been towards exact regularity. Wherever possible streets have been laid out at right angles from north to south and from east to west. Market Street, selected as the original line dividing the city into its north and south portions, is no longer a central thoroughfare, but the streets are numbered north and south from it, as they are also west from the river.

The chief east and west thoroughfares leading out from the central part of the city are Washington Avenue, Locust Street, and Olive Street, with Franklin Avenue connecting with Easton Avenue to the north. Lindell Avenue, diverging from Olive Street at Channing Avenue, near Grand Avenue, forms the principal east and west boulevard. South of Olive Street Market connects with Manchester Avenue, running through the city southwestwardly, while Chouteau Avenue, the next thoroughfare south of Market, runs east and west to Forest Park. Broadway follows the course of the Mississippi from the River Des Peres at the extreme south to the north limit of the city. Grand Avenue, planned as a boulevard spanning the city on the west, is now almost centrally located. West of it Kings Highway is an important north and south boulevard. Jefferson Avenue, east of Grand Avenue, unites with Broadway on the south and terminates northward between Palm and Farrar streets. West of Grand Avenue, where the avenues and boulevards are interrupted by parks and places or by the various additions made to the city independently of each other, thoroughfares are formed only by a connecting series of streets.

Buildings. The old Walnut Street Cathedral is the most notable survival of the French period of the history of St. Louis. The interior of the church of Sts. Peter and Paul, the oldest German Catholic church in the city (1848), is Gothic. The Broadway Court House (1839–62) in classic style is in the form of a Greek cross, surmounted by a dome 198 feet in height, with a rotunda 60 feet in diameter. The four circular galleries within the dome give opportunity for viewing the frescoes by Wimar, panels of "The Discovery of the Mississippi by De Soto," "The Founding of St. Louis by Laclède," the

Indian massacre of 1780, and a landscape panel. There are also figures of Law, Commerce, Justice, and Liberty. The Federal building (1888), formerly housing the main post office, but now the down-town branch, has a frontage of 132 feet on Olive Street by 177 feet on Eighth and Ninth, with a height of 184 feet to the top of the cupola surmounting its dome. It contains also the customhouse and Federal courts. The new main post office faces on Eighteenth Street, opposite the Union Station. The city hall, in Washington Square, described as Romanesque, distinctly suggests a French hôtel de ville of the sixteenth century. The French Renaissance is also suggested by the new municipal courts building, adjoining the city hall. The blended Renaissance and later mediæval influences of north Europe again predominate in the architecture of the imposing Union Station, on Eighteenth and Market streets. The new buildings of Washington University, the most extensive and complete in the city, are adaptations of the Tudor-Gothic fortified palace. The old Museum of Fine Arts building, no longer used for its original purpose, is in the style of the Italian Renaissance. The façade has sculptures by Kretschmar. The Public Library, designed by Cass Gilbert, is in early Italian Renaissance style and built of Maine granite. The color scheme and decorations of the interior are by Elmer E. Garnsey and clearly reflect the period of the architecture. The City Art Museum, also the work of Cass Gilbert, is classic in style, of gray limestone and Roman brick. A more recent example of the classic is furnished by the new Jefferson Memorial. The last two buildings are in Forest Park. The Protestant Episcopal cathedral, dating from early in the second half of the nineteenth century, shows both in exterior and interior the influence of the Saxon style in modifying the Gothic. The recently erected reredos, the gift of Mrs. B. B. Graham, is one of the finest pieces of stone carving in the United States. The Shaare Emeth Synagogue, one of the most impressive of the modern religious edifices, shows the Byzantine influence modifying the Gothic in the body of the building, to which is added a campanile of the earlier Italian Renaissance, adapted to the Gothic. The immense new St. Louis Cathedral (Roman Catholic), the cost of which will ultimately reach $3,000,000, is distinctly Romanesque. The interior decoration is of varicolored marbles, gilding, and mosaics, the latter by Louis Tiffany, of New York.

Of business structures representative buildings are the Railway Exchange (said to be the largest office building in the world), the Boatmen's Bank, the Century, the Pierce, the Frisco, the Third National Bank, the Bank of Commerce, the Chemical, the Wright, and the Fullerton buildings, and the collection of buildings known as Cupples Station, where a considerable part of the wholesale trade of the city is centred at the most advantageous point for handling freight. The Mercantile Club building is in the business centre. The buildings of the St. Louis Club, the University, the Columbian, the Racquet, the Liederkranz, and other clubs away from the business centre, represent different styles of residence architecture. The buildings of the St. Louis University, the various high schools, the Young Men's Christian Association, and others similar have a general tendency to reproduce the styles of the palaces and unfortified public buildings of the fifteenth and sixteenth centuries in England and France. The Pilgrim Congregational Church, St. George's (Protestant Episcopal), the church of the Messiah (Unitarian), the Second Baptist, the Second Presbyterian, St. John's Methodist Episcopal, St. Peter's (Protestant Episcopal) Church, and the several Jewish synagogues of the West End represent the more modern ecclesiastical architecture of the city.

For the buildings of the World's Fair of 1904, see Louisiana Purchase Exposition.

Parks. The 23 public parks, places, and gardens of the city have a total area of 2714 acres, including that part of Forest Park temporarily used as part of the grounds of the Louisiana Purchase Exposition. Forest Park, the largest of these, dates from 1874. It is almost directly west of the business centre. Its area of 1380 acres represents a cost of nearly $3,000,000 for ground and improvements. When acquired by the city it was far from the principal residential section, but its attractiveness has exerted so marked an influence that the residential section has grown towards it and its beauties are reproduced in neighboring private residence parks, or places. For these, the number of which is not included in the total above, the city is remarkable.

The principal parks of the southwestern part of the city are Tower Grove and the Missouri Botanical Garden adjoining it. Both of these are a gift of the late Henry Shaw, whose interest in plants made the Botanical Garden's collection of native and foreign flora one of the most extensive in America. The garden, now maintained for the public by special commissioners, has adjoining it an arboretum, which contains specimens of the American forest trees which will grow unprotected in the climate of Missouri. Large greenhouses have recently been added. Tower Grove Park, with an area of 267 acres, ranks next to Forest Park as the driving park of the city. It is highly improved, with an impressive central gateway on the east, opening on a long avenue, which, as it divides the park, has the heroic bronzes by Von Mueller, cast in Munich during Shaw's lifetime and by him presented to the city.

Carondelet Park (containing 180 acres) and O'Fallon Park (158 acres) rank next in area. Fairground Park (the old St. Louis fair grounds), 131 acres, was acquired in 1908. It is in the north-central section of the city and, owing to its level character, has been extensively developed as a municipal athletic and play centre. Here is the largest artificial swimming pool in the world. Lafayette Park, with an area of 30 acres, is more centrally located in what was formerly the most important residential section of the southern part of the city. Up to the close of 1914 the total cost of the parks acquired and improved at public expense was $3,004,931, exclusive of improvements and maintenance. This does not include the four parks managed by special commissioners.

Among the most interesting objects of art in the parks are the bronze statues of Shakespeare, Columbus, and Humboldt, by Von Mueller, in Tower Grove. That of Shakespeare is supported by a pedestal with bronze panels giving in relief the grave scene in *Hamlet*, Lady Macbeth in the sleep-walking scene, Queen Catharine confronting her accusers, and Falstaff as impersonated by Ben De Bar. The recumbent

portrait statue of Henry Shaw in the Shaw mausoleum in the Missouri Botanical Garden is by the same sculptor. A bronze statue of Thomas H. Benton in Lafayette Park is the work of Harriet Hosmer. On its pedestal are the words, "There is the East, there is India," which formed the climax of his speech made after the withdrawal of his opposition to the first transcontinental railroad. This statue, erected at the expense of the State, commemorates the completion of the railroad connecting St. Louis with the Pacific coast. Lafayette Park contains also a good bronze reproduction of Houdon's statue of Washington. Wellington Gardner's statue of Francis Preston Blair stands near the eastern entrance of Forest Park. In this park is the Confederate monument, the work of George Julian Zolnay. An allegorical figure, symbolizing the spirit of the South, is carved in low relief on a marble shaft which is the background for a bronze group of a Southern family. Forest Park also contains an equestrian statue of St. Louis the Crusading French King, for whom the city is named. This is the work of Charles Henry Niehaus. In the archway of the Jefferson Memorial building in Forest Park is the Thomas Jefferson statue by Karl Bitter. J. Wilson MacDonald's statue of Edward Bates, Attorney-General in Lincoln's first cabinet, is near the southeast corner of the same park. The marble statue of Schiller in St. Louis Park is a reproduction of the portrait statue of the poet erected at his birthplace, Marbach. The Schurz-Daenzer-Preetorius memorial is in Reservoir Park and is the work of Wilhelm Wandschneider of Berlin. It was erected by the Germans of St. Louis. The bronze statue of General Grant, first erected on Twelfth Street, now stands in front of the northern entrance of the city hall. It is the work of Robert P. Bringhurst. A statue of Pierre Laclède by George Julian Zolnay stands between the city hall and the municipal courts building.

Education, Libraries. The school system of St. Louis is notable in several particulars, chiefly in its application of the theory of manual training in connection with the work of Washington University and in its pioneer work in illustrating the practical workings of the theories of Fröbel. The school buildings represent a total cost of $17,129,885. The number of teachers employed at the close of the fiscal year 1914 was 2393, with annual salaries of $2,169,637. The number of pupils in 1914, including 16,339 in the kindergartens, was 118,200. The total school disbursements for the fiscal year 1914 were $4,803,956, of which $2,774,412 went to the department of instruction. The city supplies scholars with free books and it supports the free public library as an essential part of the system of public education.

Among the private institutions are Washington University (q.v.), with the school of fine arts, St. Louis law school, the school of social economy, Smith academy, and the manual training school; St. Louis University (q.v.), Forest Park University for Women; Mary Institute (girls' preparatory); the David Ranken Jr. School of Mechanic Trades; the Christian Brothers' College; the St. Louis College of Physicians and Surgeons; the Missouri School for the Blind; and the Kenrick Theological Seminary.

The principal libraries are the Public and the Mercantile. The Public Library contained in 1915 414,623 volumes, with an annual circulation of over 2,000,000. In addition to the main library building, already described, there are six branch buildings located in various parts of the city and a municipal reference branch in the city hall. Regular borrowers, or card holders, number over 100,000. The Mercantile Library, maintained by private subscription, occupies the upper portions of its own building on Broadway and Locust Street. It has more than 6000 members and a total of 140,000 bound volumes. It is especially rich in Americana relating to the history of Colonial Louisiana and the States and Territories formed from it. Among the objects of art in its possession are the marbles "Beatrice Cenci," by Harriet Hosmer; the "West Wind," by T. R. Gould; and portrait busts of Burns and Scott by William Brodie, R. S. A. Among its paintings are a series of the Indian studies by Catlin and the most important of Bingham's canvases illustrating the life of the early West. Other libraries are those of the Missouri Historical Society, now housed in the Jefferson Memorial, the Academy of Science, and the Medical Society.

Societies, Clubs, Theatres. The Missouri Historical Society, the Academy of Science, the Symphony Society, the Art League, the Church Federation, and the Young Men's Christian Association are prominent among the many permanent organizations formed for other than social or business purposes. The German Turner and Musical societies are important and are characteristic of influences which have affected the city. The principal clubs are the St. Louis, the Mercantile, the University, the Columbian, the Army and Navy, the Racquet, and the Liederkranz. The Noonday Club and the City Club serve lunch only and the latter makes a specialty of noon addresses on live subjects. The Town Club (for women) is a similar institution. Country clubs are numerous, among them the St. Louis Country Club, the Belle Rive, the Glen Echo, and the Florissant. The Round Table, the Commercial Club, the Contemporary Club, Town and Gown, the Public Questions Club, and the Papyrus are dinner clubs with after-dinner discussions. Among the many women's clubs, the Wednesday Club and the Women's Club have handsome buildings of their own. A unique building is that of the Artists Guild, with its exhibition hall and cryptlike dining room. There are also the Business Men's League, the Civic League, and the Merchants' Exchange. St. Louis has in addition several permanent political clubs occupying their own buildings.

The principal theatres are the Olympic, the Shubert, the Victoria, the Garrick, the Park, the Imperial, the Gaiety, the Odéon, and the Columbia. The Odéon has a seating capacity of 2200 and the Olympic 2400. Among those devoted chiefly to moving pictures are the New Grand Central, the Kings, the Princess, the Empress, and the West End Lyric.

Commerce and Industry. The railroad systems of which St. Louis is a centre converge here from all parts of the United States and also from Mexico and Canada, though the country in which the city has fostered railroad development most in marketing its output lies south of Nebraska and west of the Mississippi. The 24 railroads of which it is a terminus have dwarfed the influence of the Mississippi as the determining factor of its trade without

lessening the great advantage of direct river communication with tidewater. The total annual shipments by rail and river were 21,922,765 tons for 1914. The total freight received, including coal imported for home consumption, reached 30,334,057 tons. With a capital and surplus of $77,754,676, the banks and trust companies reported annual clearings of $3,888,851,608 for 1914.

Though St. Louis is important as a manufacturing city and markets its own industrial output, it is still more important commercially as a distributing centre for products representing the entire country. Its location makes it a point of clearing between manufactured products and the products of the soil for which they are exchanged. Its approximate annual receipts of grain are 78,399,102 bushels; cotton, 580,892 bales; cattle, 1,073,386 head; hogs, 2,871,558 head; coal, 8,051,088 tons; lead, 3,611,500 pigs; zinc and spelter, 4,103,985 slabs; hides, 64,598,200 pounds; wool, 21,147,900 pounds. The principal items of its annual sales (in millions of dollars) are: dry goods, 65; groceries, 74; boots and shoes, 63; tobacco and cigars, 52; shelf and heavy hardware, 47; woodenware, 20; lumber, 45; candy, 5; beer, 22; clothing, 21; furniture, etc., 20; agricultural machinery and vehicles, 19; electrical machinery and supplies, 18; drugs, sundries, medicines, etc., 25; glass, glassware, and queen's ware, 7; terra-cotta and clay products and brick, 4; stoves and ranges, 8; paints and oils, 14; hats and caps and gloves, 5; saddlery and harness, 3; plumbers' and steamfitters' supplies, 9; furs, 5; railway supplies, 11; trunks, bags, etc., 5; steel castings and foundry and machine-shop products, 16; railroad and street cars, 25; carpets, 7; paper, stationery, and envelopes, 11; bakery products, 11; tin, enamel, and galvanized ware, 12; soap and candles, 15. The figures in dollars given above for tobacco represent a gross volume of 76,022,676 pounds and support the claim of the city as "the largest tobacco market in the world."

The total number of manufacturing establishments in St. Louis in the year 1913 was 2488, with a capital of $247,622,158 and a total product of $378,731,470. The most important items were manufactured products of tobacco, malt liquors, clothing, boots and shoes, brick and stone, railroad cars, bakery products, wagons and carriages, flour and gristmill products, millinery, iron and steel, furniture, bags, boxes, candy, copper and brass, drugs, electrical apparatus, foundry products, men's and women's furnishings, groceries, packinghouse products, paints, rope, soap and candles, stoves, tin, sheet-iron and galvanized ware, and newspapers, books, and periodicals. The minimum annual output represented in any one of these lines is $3,000,000; the maximum (for shoes) is $49,415,702. These figures do not include the manufacturing activities of the city's suburbs, both in Missouri and Illinois. East St. Louis, the principal industrial suburb on the Illinois side of the river, is connected by the magnificent Eads Bridge for railroads, wagons, and foot passengers. (See BRIDGE.) The McKinley Bridge carries a large interurban electric railway system into St. Louis and is also for wagon and foot passengers. The Municipal Bridge, being erected by the city, is nearing completion and will accommodate railways, vehicles, and pedestrians. The Merchants' Bridge, connecting the Illinois terminals of St. Louis railroads with the Union Station system of terminals, is for railroads only. The Union Station covers about 11 acres of ground with its main buildings and adjacent sheds.

St. Louis is a port of entry. Its exports are chiefly to Mexico, South America, and the West Indies. Its direct trade with the Philippines, mainly in malt liquors, has assumed some importance. The principal export shipments of flour and grain are to Central and South America, Mexico, Cuba, England, Scotland, Ireland, Holland, and Germany. Exports to Europe consist largely of provisions. The principal items are dry-salt and sweet-pickled meats, oleo, lard, and hides. Exports of agricultural supplies, hardware, electrical supplies, machinery, glass, etc., are mostly to Spanish America. The direct imports through the St. Louis customhouse were $8,365,538 for the calendar year 1914.

Administration and Municipal Activities. St. Louis has to a degree the combined administrative machinery of city and county. The city is in no county at all, but in the discharge of county functions is regarded as a county. Since the adoption of the present charter in 1914 the municipal government has been vested in a unicameral legislative body, the board of aldermen whose 28 members, while each represents a ward of the city, are chosen by the voters at large, and in an executive department, consisting of the mayor and the departments under him. With the exception of the comptroller all department heads are appointed by the mayor. Provision is made for the initiative, referendum, and recall. The sheriff, coroner, civil and criminal judges (except the police judges), election, liquor license, and police officials are technically State officers. The police are not subject to the mayor but to a board of commissioners appointed by the Governor of the State. The expense of this virtually independent department is paid on its own estimates from the city treasury. The management of the public schools through an elective school board is also conducted independently of the mayor and the departments which are under him. There is a separate Public Library board of 9, appointed by the mayor.

Direct control of public utilities extends to the water-supply system, streets and sewers, public parks, and schools. The income from franchises in 1914 was $575,169, out of total receipts of $20,253,715, of which $11,226,362 were from taxes and licenses and $2,206,385 from water rates. The net expense of maintaining the water service, exclusive of extensions, etc., was $1,079,642. The disbursements for all purposes were $19,007,942, including $864,030 for public debt, $2,139,446 for police, $1,131,212 for health, sanitation, and public charities, $1,312,848 for the fire department, $739,591 for public lighting, $1,718,405 for maintaining and improving streets, $644,669 for courts and prisons, $307,071 for elections and registration, and $498,443 for parks. The bonded debt of the city, including the indebtedness incurred for the promotion of the Louisiana Purchase Exposition, reaches $24,387,000. The total value of property as assessed for taxation is $615,917,182.

The sewer system includes 808 miles of completed sewers, costing $23,072,029. The water works have a capacity of 150,000,000 gallons daily, while the daily consumption is less than

85,000,000. The largest sand-filtration plant in the United States, opened in 1915, at the Chain of Rocks on the Mississippi north of the city, insures, together with a chemical coagulation process, drinking water of unusual purity. The street railroads, with a single-track mileage of 382, carry in average years more than 375,000,000 passengers.

The public charities comprise a city dispensary, city hospital, tuberculosis hospital, contagious-disease hospital, municipal lodging house, insane asylum, poorhouse, and industrial school, the last-named institution serving the double purpose of prison and reform school for youthful delinquents. A juvenile court for dealing with these offenders was introduced in 1903. A free legal-aid bureau has been established. The Missouri School for the Blind is maintained at the expense of the State, with none of the features either of an asylum or a reformatory. The city health department includes a department of experimental bacteriology, which serves in tracing and checking germ diseases. The health department and all public charities are controlled by a director of public welfare. This official also has supervision over the park department, under which municipal recreational activities have been highly developed.

At the close of the fiscal year 1914 the city had 642.4 miles of paved streets, of which 260.8 were paved with macadam, telford, etc., and the rest with granite, asphalt, brick, wood block, etc. Of the total mileage of streets, reported as 932.6 (1914), there were still unpaved 290.23 miles.

Population. The population was, in 1880, 350,518; in 1900, 575,238; in 1910, 687,029. The estimate for 1915 is 750,000. From 1810, the date of the first Federal census, to 1880, the totals include with the city of St. Louis the population of St. Louis County, which in 1880 was separately enumerated at 31,888. The population of city and county prior to 1880 was as follows: 1810, 5667; 1820, 10,049; 1830, 14,125; 1840, 35,979; 1850, 104,978; 1860, 190,524; 1870, 351,189. The population of the town itself was, in 1799, 925; 1810, 1400; 1820, 4000; 1830, 4977; 1840, 16,469; 1850, 77,860; 1860, 160,773; 1870, 310,864; 1920, 772,897.

The great growth between 1840 and 1850 had for one of its causes the German emigration following the revolutionary movement of 1848. This influence has been continuous. In 1910, 47,765 out of the total of 125,706 foreign-born residents of the city were natives of the German Empire. This was 38 per cent, exclusive of Austrians of German race. In 1910, 11.3 per cent of the foreign-born population was of Irish nativity, 4.1 per cent of English, 12.3 of Russian, 6 of Italian, and 8.8 of Austrian. Although the total of foreign-born is comparatively small, the native population born of white foreign parents is 246,946, the native population born of native white parents being 269,836. The total negro population was 43,960.

History. In 1764 Auguste Chouteau, then 25 years of age, acting under orders from Pierre Laclède Ligueste, established a fur-trading station at St. Louis, and later in the same year Ligueste himself arrived and laid out a town which he predicted would become one of the largest cities in the country. At first called Laclède's Village, the place soon was named St. Louis in honor of Louis IX of France. In 1762, by secret treaty, France had ceded all her territory west of the Mississippi to Spain, but the latter did not take possession until 1770, when St. Louis became the capital of Upper Louisiana and Lieutenant Governor Don Pedro Piernas took possession with a small body of Spanish troops. At that time the population was about 500. Though Spain continued in possession until 1803, the town remained essentially French. On May 26, 1780, a large force of Indians, instigated by the English, attacked the place, but did comparatively little damage, though this year was afterward known locally as *l'année du grand coup*. In 1803 Louisiana was formally retroceded to France in pursuance of the Treaty of San Ildefonso (1800), but several months later the United States came into possession by virtue of the Louisiana Purchase (q.v.). After this immigration from the Eastern States was rapid and St. Louis increased greatly in size and importance. The first newspaper began publication in 1808 and in 1809 the town was incorporated. With the appearance of the first steamboat in 1815 a new epoch began for St. Louis. John Jacob Astor opened here the Western branch of the American Fur Company in 1819, and the annual shipments soon amounted to $200,000. St. Louis was chartered as a city in 1822, though its exceptionally rapid progress did not begin until about 10 years later. In 1849 a fire destroyed property valued at $3,000,000 and an epidemic of cholera caused the deaths of 4000 of the 74,000 inhabitants. During the Civil War the sympathies of perhaps the majority of the people were with the South, and here in 1861 began the contest between the Unionists and the Secessionists for the control of Missouri. The Louisiana Purchase Exposition (q.v.), which was to have been held in 1903 to commemorate the acquisition of Louisiana, was postponed to 1904. In 1914 a great historical pageant and masque in Forest Park were witnessed by audiences of over 100,000.

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SAINT LOUIS, Order of. A French military order of merit with three classes, founded by Louis XIV in 1693, dissolved during the Revolution, restored by Louis XVIII, and finally extinguished in 1830. The decoration, a white

eight-pointed cross with lilies in the angles, bore the image of St. Louis and the inscription *Lud. Magn. Inst. 1693.* On the reverse was a flaming sword with the inscription *Bellicæ Virtutis Præmium.*

SAINT LOUIS RIVER. A river rising in St. Louis Co., northeast Minnesota. It flows south about 160 miles and southeast about 50. The St. Louis has many falls, and narrows with rapids have produced the well-known slab formation (Dalles). It enters Lake Superior near Duluth.

SAINT LOUIS UNIVERSITY. A Roman Catholic institution for higher education, founded in 1832 at St. Louis, Mo. Its charter was the first granted to any university west of the Mississippi River. It succeeded an academy founded under the patronage of Bishop William Louis Du Bourg in 1815. Two years later a new building was erected and the institution was called a college. In 1829 it passed from the control of the Catholic secular clergy to that of the Society of Jesus, and two years later received its charter under its present name. Within the following 10 years there were opened departments of philosophy, medicine, architecture, music, fine arts, divinity, and law. During the Civil War all the departments except the college department were given up, and for the greater part of this period one course only, that leading to the degree of A.B., was carried on. During recent years professional schools have been resumed, and the present organization includes the college of liberal arts, school of philosophy and sciences, school of divinity, the medical school, dental school, school of commerce and finance, the academies or high-school department, and the institute of law, which is really two schools, a day school and a night school. The school offers three courses leading respectively to the degree of A.B., S.B., and Litt.B. The buildings of the university are almost all in the very centre of St. Louis, except the medical and dental schools, which are a mile south of the main group. In 1915 there were 1471 students enrolled in all departments, and the faculty numbered 252. The library includes nearly 75,000 volumes. A museum and an art college are maintained. The university has no endowment and the members of its faculty, who are all members of the Society of Jesus, teach without compensation. The tuition of the students and a small contribution are the only sources of income. This amounts annually to about $30,000. The value of the buildings and property is about $2,000,000. By the will of the late James Campbell the medical department is made the legatee of his entire estate of about $16,000,000. The president in 1915 was Bernard J. Otting, S.J.

SAINT LOUIS WORLD'S FAIR. See Louisiana Purchase Exposition.

SAINT LUCIA, lōō′shī-ȧ. The largest of the British Windward Islands, West Indies. It is situated 25 miles north of St. Vincent and about the same distance south of Martinique (Map: West Indies, G 4). Area, 233 square miles. The island is volcanic and mountainous, with an active volcanic peak over 3000 feet high. The rainfall is abundant and the mountains are covered with luxuriant tropical forests. The chief agricultural products are sugar, cocoa, logwood, coffee, and spices. By reason of the exceptionally good harbor at Castries, St. Lucia has more shipping than any other British West Indian island except Jamaica, which it nearly equals. The imports and exports in 1913 were £288,405 and £274,459 respectively. Pop., 1911, 48,637, chiefly negroes. Capital, Castries (q.v.). St. Lucia was discovered in 1502 and colonized by the French in 1635. It changed hands between England and France a number of times, until it became permanently a British possession in 1803. In 1898 it suffered severely from a hurricane.

SAINT LU'CIA BARK. See Exostemma.

SAINT LUKE, Academy of (Accademia di San Luca). The academy of the fine arts at Rome. In the later Middle Ages there was a guild of painters at Rome, whose sanctuary was the small church of San Luca, on the Esquiline. It first appears on record in 1478, when it renewed and revised its ancient statutes and assumed the name Università delle Belle Arti. The present academy, organized after the plans of the painter Muziano, was first recognized in a brief of Gregory XIII in 1517, its immediate recognition having been prevented by the opposition of the elder society, which it finally absorbed. Under Sixtus V the new organization was placed under the patronage of St. Luke and endowed with the revenues of the church of Santi Martino e Luca. The academy owed much to Zuccari, its first prince, who left it his fortune. In 1700 Clement XI instituted and endowed the annual prizes of painting, sculpture, and architecture. The constitution of the academy was but slightly modified until 1818. At the head stood a prince, appointed annually. In 1818 Pius VII, following the advice of Canova, granted a new constitution.

There are 36 academicians—painters, sculptors, and architects—besides foreign and honorary members; at the head of the academy is a president, elected annually. It also maintains a school of design, in which instruction in painting, sculpture, and architecture is given. Besides its private endowment the academy receives a subsidy of 35,000 francs from the state. It has retained its quarters in the Via Bonella, near the Forum Romanum. Its valuable collection of paintings contains good examples of Gaspard Poussin, Claude Lorrain, Titian, Veronese, Salvator Rosa, Guido Reni, and the much discussed "Saint Luke Painting the Madonna," formerly attributed to Raphael. The academy also possesses a small collection of sculpture, presented by the artists, and the valuable Biblioteca Sarti, presented in 1881. It has been of great influence and celebrity, the French and English academies having been modeled upon it. Consult Armand, *L'Académie de Saint Luc à Rome* (Rome, 1866).

SAINT LUKE, Guilds of. Mediæval associations of painters, under the patronage of St. Luke, formed to protect the interests of their members. Engravers, printers, and members of other occupations related to bookmaking were later received into the guilds, which had a long existence in Holland and flourished particularly in Antwerp.

SAINT LUKE'S SUMMER. See Indian Summer.

SAINT-MALO, săn′-mȧ′lō′. A seaport and the capital of an arrondissement in the Department of Ille-et-Vilaine, France, 51 miles north by west of Rennes, at the mouth of the Rance River, on the English Channel (Map: France, N., C 4). It is attractively situated on a rocky peninsula, and with its narrow winding streets

and sixteenth-century ramparts has a very picturesque appearance. A rolling bridge (Pont Roulant) connects Saint-Malo with the suburb of Saint-Servan across the harbor. The fifteenth-century parish church, a former cathedral, the fourteenth-century castle, the casino, museum, and library are noteworthy features. The town carries on a considerable trade in agricultural produce, coal, and lumber, has large cod-fishing interests in connection with Newfoundland, and regular steamship communication with the Channel Islands and Southampton. Shipbuilding and ironworking are also important industries. Pop., 1901, 11,486; 1911, 10,647. Saint-Malo received its name from St. Malo, a Welsh monk, who came here in the sixth century. It was at the zenith of its prosperity in the seventeenth and eighteenth centuries. The English attempted at various times to capture the town, but were unsuccessful.

SAINT-MARC, săn'-märk'. The capital town of the Department of Artibonite, Haiti, 45 miles northwest of Port-au-Prince, on Saint-Marc Bay (Map: West Indies, D 3). Its chief export is coffee. Pop. (est.), 20,000.

SAINT-MARC GIRARDIN, săn'-märk' zhĕ'-rär'dăn', FRANÇOIS AUGUSTE (known as MARC GIRARDIN) (1801–73). A French author and journalist, born in Paris. He obtained a professorship in the Lycée Louis-le-Grand in 1827 and in the same year began his long political and literary connection with the *Journal des Débats*. He was elected to the Chamber of Deputies in 1834 and again in 1837. From 1848 until 1871 he gave himself up almost entirely to literary work. In the latter year he was returned to the National Assembly, elected Vice President, and became an active supporter of the policy of Thiers. Girardin lectured on literature at the Sorbonne for more than 30 years. He published numerous works on history and literature, among which are: *Tableau de la marche et des progrès de la littérature française au XVIème siècle* (1828); *Cours de la littérature dramatique ou de l'usage des passions dans le drame* (1843); *Essais de littérature et de morale* (1845); *La Fontaine et les fabulistes* (1867); *La chute du Second Empire* (1874); *J. J. Rousseau: sa vie et ses ouvrages* (1875). Consult Tamisier, *Saint-Marc Girardin: étude littéraire* (Paris, 1876).

SAINT MARK'S CHURCH (SAN MARCO) in Venice. Originally the chapel attached to the palace of the Doge and the national sanctuary of the Venetians, but since 1807 the cathedral of Venice. It derives its name from the patron saint of Venice, the Evangelist Mark, whose reputed relics were transported from Alexandria to Venice in 828. The church was built in the ninth century, destroyed by fire in 976, and wholly reconstructed between 1047 and 1094, substantially upon the present plan, though without so extensive a narthex, and adorned merely with lines of colored brick and brick set in patterns, here and there; a very simple church in the form of a Greek cross with five low cupolas. All the essential elements of its plan and construction were derived from Constantinople, probably from the church of the Holy Apostles (demolished in 1453). In the twelfth century there began a series of alterations tending to make the church still more Oriental than it was originally. The present vaulted narthex was constructed; the mosaic decoration of the interior, begun by Byzantine artists in the eleventh century, was carried much further; the walls within were sheathed with slabs of richly colored marble; decoration by incrusted marbles and mosaics was added to the exterior; and finally in the Gothic period (fifteenth century) the lofty metal-sheathed wooden domes over the five cupolas, the pinnacles, the crockets, and other florid adornments of the exterior were added. The result is the church as we have it to-day, the most splendid piece of polychromatic architecture in Europe and more splendid in color even than St. Sophia at Constantinople in its present condition.

The church is about 250 feet long over all and 170 from north to south over the transepts. The west front is preceded by a narthex in five bays, with deep porches opening upon the Piazza di San Marco. The famous bronze horses which are supposed to have been brought from Constantinople and to be of antique make are set above the central porch. The narthex, which is throughout vaulted with domes or pendentives, is carried around the sides of the nave or western arm of the cross, but the southern arm is occupied in part by the baptistery and in part by the chapel called the Cappella Zen. The narthex vaults are covered with mosaics of subjects from the Bible history. Most of these are of the twelfth and thirteenth centuries, but immediately over the main doorway leading into the church is a magnificent St. Mark from drawings by Titian.

On entering the church the impression is again that of a relatively low but singularly rich interior. Everything is near to the eye; the mosaics of the high vaults can be easily made out, although the church is not brightly lighted by day or by night. It is, however, full of beautiful details, and these are combined with singular skill and singular good fortune to produce one of the most beautiful interiors in the world in spite of diversities of style and period. The high screen of the choir with a flight of steps leading to it; the statues which crown this screen; the ciborium behind it, under which is the high altar and behind which is to be seen at certain times the famous *pala d' oro*, an altar screen of Byzantine work in silver, silver gilt, enamel, and precious stones; the marble and alabaster columns and sheathings of the walls, the shrines and side altars in other parts of the church; the delicate low-relief carvings of Byzantine style which front the parapets of the balconies or are incrusted in the walls; the very beautiful pulpits and font; and above all, the splendid harmony of color in the mosaics upon a ground of broken and varied gilding, the surface being made up of small tesseræ, which are in different planes and reflect the light at different angles—all contribute to a result the most consummate that we can point to, of architectural effect produced by colored light and shade, but with little reference to the traditional proportions of any recognized style.

Besides the church proper there are several minor chapels other than those mentioned, and on the south there is a very remarkable sacristy, to which is attached the famous treasury of St. Mark's, which contains a precious collection of church plate, jeweled book bindings, and other artistic treasures of the early Middle Ages.

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SAINT MARTIN, *Fr. pron.* săn' mär'tăn'. An island of the Lesser Antilles, situated 180 miles east of Porto Rico (Map: West Indies, G 3). Area, 37 square miles. It is mountainous and destitute of forests and scantily watered, though it produces and exports some sugar, cotton, and tobacco. It belongs partly to France and partly to the Netherlands. The French portion has 20 square miles and a population (1911) of 4144; the Dutch portion has 17 square miles and a population (1908) of 3817.

SAINT-MARTIN, săn'-mär'tăn', Alexis. See Beaumont, William.

SAINT-MARTIN, Louis Claude de (1743–1803). A French mystic, who wrote under the pseudonym Ph. Inc. or Philosophe Inconnu. He was born at Amboise, studied law and practiced at Tours, then entered the army, and for a time was stationed at Bordeaux. Having come under Swedenborg's sway, Saint-Martin left the army. He traveled through England, Germany, Switzerland, and Italy, preaching his new doctrine, then settled in Paris, later in Auray. His *Des erreurs et de la vérité* (1775) presents Pasqualis' doctrine for the most part, while the *Nouvel homme* (1792) is tinged with the mysticism of Böhme. The modern Martinists bear his name. Consult Matter, *Saint-Martin, le philosophe inconnu* (Paris, 1864), and Claassen, *Saint-Martin* (Stuttgart, 1891).

SAINT-MARTIN, Louis Vivien. See Vivien de Saint-Martin, Louis.

SAINT MAR'TIN'S SUMMER. See Indian Summer.

SAINT MARY AND ALL SAINTS, LINCOLN. See Lincoln College.

SAINT MARY LE BOW, or Bow Church. A church on Cheapside, London, dating from the second half of the seventeenth century. The lofty spire, 235 feet in height, contains the famous Bow Bells.

SAINT MARYS. A town in Perth County, Ontario, Canada, situated on the Thames River and on the Grand Trunk and Canadian Pacific railways, 100 miles by rail west-southwest of Toronto (Map: Ontario, D 7). Pop., 1901, 3384; 1911, 3388.

SAINT MARYS. A city in Auglaize Co., Ohio, 22 miles southwest of Lima, on the Miami and Erie Canal, on St. Marys River, and on the Lake Erie and Western and the Toledo and Ohio Central railroads (Map: Ohio, B 4). St. Marys is primarily an industrial centre, its chief establishments including machine shops, woolen mills, and manufactories of vehicle wheels, lumber products, chains, strawboards, paper and pasteboard boxes, cigars, plows, and flour. Pop., 1900, 5359; 1910, 5732.

SAINT MARYS. A borough in Elk Co., Pa., 142 miles south by east of Buffalo, N. Y., on the Pennsylvania and the Pittsburgh, Shawmut, and Northern railroads (Map: Pennsylvania, D 3). There is a noted academy of the St. Benedict Sisterhood. In the region are supplies of soft coal, natural gas, fire clay, and lumber. Besides a large sewer-pipe plant, saw and planing mills, and flour mills, there are manufactories of chemicals, electrical supplies and fireproofing, and large railroad shops. The borough was incorporated in 1848. Pop., 1900, 4295; 1910, 6346.

SAINT MARYS CANAL. A canal system around the St. Marys Rapids, at Sault Ste. Marie, Michigan and Ontario, notable for carrying the largest amount of water-borne traffic of all artificial waterways of the world. These short canals, of which there are several, are located on both the American and Canadian sides of the St. Marys River (see Saint Marys River), having been constructed and maintained by the respective governments. The fall of the rapids ranges from 17 to 21 feet of the varying stages of water. The first canal on the Canadian side was built by the Northwest Fur Company in 1797 to 1798, having a lock 38 feet in length, 8 feet, 9 inches wide, and a lift of 9 feet, through which bateaux and canoes were carried up the river. The first ship canal was built on the American side of the river in 1853 to 1855 and was 1 1/2 miles long, 64 feet wide at the bottom and 100 feet wide at the water surface, having two tandem locks of masonry, each 350 feet long, 70 feet wide, with a lift of about 9 feet. The depth of the canal was about 13 feet and in the locks about 11½ feet. These locks were used until 1888, when they were destroyed by excavations for the Poe lock.

The first of the modern locks, the Weitzel lock, 515 feet long, 80 feet wide in chamber, narrowing to 60 feet at the gates, and 17 feet of water on the mitre sills, was built by the United States government in the years 1870 to 1881, being named for General Godfrey Weitzel, U.S.A., who was in charge of the district from 1872 to 1882. The next important lock to be constructed was further to the north and is known as the Poe lock, named for General Orlando M. Poe, U.S.A., engineer officer for years in charge of the district. This lock is 800 feet in length, 100 feet wide, with 22 feet of water on the sills, and was built by the United States government in the years 1877 to 1896. In the meantime the Canadian canal, 1⅛ miles in length, 150 feet wide, and 23 feet deep, with a lock 900 feet in length and 60 feet wide, with 22 feet of water on the mitre sills, was built on the north side of the river in 1888 to 1895. This canal shared the traffic with that on the American side, and for many years was used by the larger vessels on account of its greater depth. The growth in traffic led the United States to build (1908–14) a new third, or Davis, lock, 1350 feet in length, 80 feet wide, having 24.5 feet of water upon its mitre sills. In 1914 the channel or canal leading to the older locks was deepened in its upper reach to 24.6 feet, a new canal was excavated to the third lock and also to the fourth lock, which was later put under construction under authorization of Congress, July 25, 1912.

The approximate cost of these various locks has been as follows up to 1915:

Locks and canal of 1855	$1,000,000
Weitzel lock	1,000,000
Poe lock	3,000,000
Third lock and new canal	5,000,000
Widening and deepening canal	4,400,000
Improving channel through river	9,400,000
Canadian lock canal and approaches	5,000,000

VENICE

PIAZZA, ST. MARK'S, AND CAMPANILE

When the United States canal was first opened in 1855 it was controlled by the State of Michigan. In 1881 the control was transferred to the United States government.

In 1915 the total freight traffic of both American and Canadian canals amounted to 71,290,304 short tons. The maximum amount ever handled was 79,718,344 short tons in 1913. The total tons net register of vessels passing through the canals in 1915 was 56,399,147 and the total number of vessel passages through the canals was 21,233. The total number of passengers transported was 50,336 as compared with 59,801 in 1914. See CANAL; GREAT LAKES.

SAINT MARYS RIVER. The channel connecting Lake Superior with Lake Huron. It flows 40 miles southeastward on the boundary between the upper peninsula of Michigan and the Canadian Province of Ontario (Map: Michigan, E 2). It is divided by several large islands into two main channels, each of which has lakelike expansions from 2 to 10 miles wide. It falls 21 feet. Most of this descent occurs at the St. Marys Rapids, about 1 mile long, near the upper end. Transportation around the rapids was at first accomplished by a tramway along the Michigan shore, but this method was replaced in 1855 by a ship canal. See SAINT MARYS CANAL.

SAINT MARY'S SEMINARY. A Roman Catholic institution in Baltimore, Md., established in 1791 by the Society of St. Sulpice. It is a branch of the seminary established by the society in Paris in accordance with the decree of the Council of Trent. There are two departments, philosophy and theology, the former leading to the degrees of A.B. and A.M., the latter to the degree of bachelor of theology. The courses cover two and four years. The library contains about 31,000 volumes. The attendance in 1914–15 was 310, and the faculty numbered 22. The superior in 1915 was Rev. E. R. Dyer, D.D.

SAINT MARY THE GLORIOUS. See GLORIOUS VIRGIN.

SAINT-MAUR, săn′-mōr′, CONGREGATION OF. See BENEDICTINES.

SAINT MAURICE (mô′rês′) **RIVER.** A northern tributary of the St. Lawrence River, Canada, 300 miles long. It rises in a group of lakes and enters the St. Lawrence River at the city of Three Rivers, 9 miles below Lake St. Peter (Map: Quebec, H 5). It is navigable near its mouth and again for 75 miles between Grand Piles and the Hudson Bay station of La Tuque. It affords transportation for an extensive lumber region.

SAINT-MÉRY, MÉDÉRIC LOUIS ELIE MOREAU DE. See MOREAU DE SAINT-MÉRY, M. L. E.

SAINT MICHAEL, mī′kel. An island in Norton Sound, 100 miles south of Nome (Map: Alaska, F 4). It has a population of about 300. Its importance consists entirely in its being the transfer point, for five months each year, of freight from ocean steamships to river boats for carriage to the watershed of the Yukon.

SAINT MICHAEL, ORDER OF. 1. A French order, founded in 1469 by Louis XI, with 36 knights, afterward greatly extended. Louis XIV restricted the membership to noble families. The order ceased about 1830. Its motto was *Immensi Terror Oceani.* The decoration was an eight-pointed cross with fleurs-de-lys, the medallion bearing a representation of the archangel Michael and the Dragon. 2. A Bavarian order founded in 1693 by Elector Joseph Clement of Cologne, Duke of Bavaria. It was instituted to uphold the Catholic faith, but in 1837 became an order of merit. The decoration is an eight-pointed cross of blue enamel, bearing the image of St. Michael, with a shield inscribed *Quis ut Deus.* The four arms of the cross bear the letters P. F. F. P. (*Principi Fidelis Favere Patriam*).

SAINT MICHAEL AND SAINT GEORGE, ORDER OF. A British military and civil order of merit with three classes, founded by George III in 1818. It was intended to commemorate the acquisition of Malta and was designed originally for British residents of the Mediterranean regions. The cross of the order, of white enamel, shows the archangel Michael with the legend *Auspicium Melioris Ævi;* on the reverse is an image of St. George. See Plate of ORDERS.

SAINT MICHAEL'S, mī′kelz (SÃO MIGUEL). The largest and most important of the Azores (q.v.) and near the eastern end of the group (Map: Spain, B 5). Area, 299 square miles. The island is mountainous and rises in its highest summit to 3560 feet. There is an extensive export trade in wine, oranges, tea, and pottery. Pop., 1900, 125,183; 1910, 116,286. Chief city, Ponta Delgada (q.v.).

SAINT MICHAEL'S MOUNT. A lofty, pyramidal island of slate and granite in Mount's Bay, Cornwall, England, 18 miles west of Falmouth. It communicates with the shore by a natural causeway 400 yards long, which is uncovered at low tide. The knob, 230 feet high and about 1 mile in circumference, is crowned by an old and picturesque abbatial castle, restored and now used as a manorial residence. At the base of the mount is a small fishing village. St. Michael was the British Dinsol and the Roman Ictis and at an early period became the seat of a religious house. At the Conquest the monastery of St. Michael was annexed to the abbey of Mont-Saint-Michel (q.v.) in Normandy, its more distinguished prototype. It long remained in the possession of the monks, but since 1660 has belonged to the St. Aubyn family.

SAINT MORITZ, mō′rits. A watering place in the Upper Engadine, in the Grisons, Switzerland, 11 miles northeast of Maloggia (Map: Switzerland, D 2). It is frequented both as a summer and winter resort. Altitude, 6033 feet. Pop., 1900, 1578; 1910, 1694. It is just north of the Lake of St. Moritz and is the highest village in the Engadine. The views are beautiful. The Baths of St. Moritz, situated about a mile to the south, with an elevation of about 5823 feet, are among the best known in Switzerland. The waters contain alkaline salts and carbonic acid. There is a fine Kurhaus. The fame of St. Moritz dates from 1589, when Paracelsus drew notice to the excellence of its waters.

SAINT-NAZAIRE, săn′-nȧ′zâr′. A seaport and the capital of an arrondissement in the Department of Loire-Inférieure, France, 40 miles west of Nantes, at the mouth of the Loire River (Map: France, N., C 5). The harbor is spacious and has undergone extensive improvements. Saint-Nazaire is primarily a commercial city. It does a large over-seas trade, averaging about $7,000,000 annually. Farm and garden produce, fruit, wine, and silk and woolen goods constitute the leading shipments. The industrial interests are represented by iron foundries, shipbuilding yards, and flour and lumber mills. Pop., 1911, 38,267.

SAINT-NICOLAS, nĕ'kō'lä'. A town in the Province of East Flanders, Belgium, 13 miles west-southwest of Antwerp (Map: Belgium, C 3). It stands in the midst of the Pays de Waes, a densely peopled and productive agricultural district. A market is held in the great square of the town, one of the largest in Belgium. The manufactures include woolen and cotton goods, pins, lace, hosiery, etc. Pop., 1900, 30,484; 1910, 34,037.

SAINT O'LAF, Order of. A Norwegian order of merit, founded in 1847 by Oscar I of Norway and Sweden. The decoration is a white cross bearing the Norwegian arms on a red ground, with the device *Ret og Sandhed* (Right and Truth) on the reverse.

SAINT OLAF COLLEGE. A Lutheran institution for higher education at Northfield, Minn. Founded in 1874, it is owned and controlled by the United Norwegian Lutheran church of America. It is coeducational, with college, academy, and music departments, and had, in 1915, 555 students and 34 teachers. The grounds, embracing 138 acres of land, with the college buildings, are valued at $561,200. The college has an endowment of $250,000. The president in 1915 was L. A. Vigness.

SAINT-OMER, săn'tō'mâr'. The capital of an arrondissement in the Department of Pas-de-Calais, France, 25 miles south by east of Calais, on the Aa River and the Neuf-Fossé Canal (Map: France, N., H 2). Its most interesting feature is the church of Notre Dame, a thirteenth-century Gothic edifice. It has four portals, one of which is embellished with a "Last Judgment." Other places of interest in the town include the ruins of the old Benedictine abbey with a huge tower 190 feet high, the Coste Military Hospital, occupying the site of an early Jesuit college, the Collège Saint-Bertin, the church of the Holy Sepulchre, and the museum. The commercial advantages have been greatly increased by the hydraulic lift in the Neuf-Fossé Canal. Considerable trade is carried on in manufactured articles, comprising pipes, paper, flour, liquors, hosiery, and textiles, and in farm and garden produce. Saint-Omer owes its origin to the churches and monasteries founded here in the seventh century by Omer, Bishop of Thérouanne, and other ecclesiasts. Pop., 1901, 20,687; 1911, 20,993.

SAINTONGE, săn'tônzh'. A former province of western France, now included within the Department of Charente-Inférieure (q.v.). Its capital was Saintes.

SAINT-OUEN, săn'twän'. A suburb of Paris on the right bank of the Seine, 1 mile north of the city walls (Map: Paris and Vicinity). It has a famous race course in the former park of the château of Saint-Ouen, where Louis XVIII, in May, 1814, signed the famous declaration promising a charter to France. Saint-Ouen has educational institutions and is important for its manufactures of firearms, glass, sugar, perfumery, India rubber, tinned foods, and varnish. There are extensive docks along the Seine. Pop., 1911, 41,507.

SAINT PAN'CRAS. A northern borough of London (q.v.), England, lying east and north of Regent's Park. Within its limits is St. Pancras Station, the important terminus of the Midland Railway. The parish church in Euston Square, built in 1819, has a side chapel which is a reproduction of the Erechtheum at Athens. Pop. (borough), 1901, 234,912; 1911, 218,387.

SAINT PAT'RICK, Most Illustrious Order of. An Irish order of merit founded by George III in 1783 and consisting of the sovereign, the Lord Lieutenant of Ireland, who is grand master, and 22 knights companions of noble rank, in addition to a number of princes of the blood. The badge is a white oval shield showing the cross of St. Patrick with a shamrock and three golden crowns. The motto is *Quis Separabit.* The ribbon is blue.

SAINT PATRICK'S CATHEDRAL. The name of several Roman Catholic cathedrals in the United States and of the Protestant cathedral at Dublin, Ireland, built in 1190 and restored in 1864. The most important of American churches dedicated to St. Patrick is the cathedral of the archdiocese of New York, situated on Fifth Avenue at Fiftieth Street. It is a handsome Gothic edifice of white marble, begun in 1858 and dedicated in 1879, although the beautiful twin spires, 332 feet high, were not completed until 1886. It was consecrated Oct. 5, 1910. It is a three-aisled cruciform church, somewhat over 300 feet long over all, with side chapels, a complete *chevet* with ambulatory and chapels, and a beautiful Lady chapel, added in 1898, at the extreme east end. It was designed by James Renwick (q.v.), who gave his services without pay and who endeavored to blend in its design elements from the Gothic styles of Great Britain, France, and Germany, the three nations which had chiefly contributed to the Roman Catholic population of the diocese. Thus, the plan and proportions are French, the vaulting (unfortunately in plaster) is English, while the towers recall German traceried spires. The Archbishop's house and a presbytery adjoin it at the east end. The total cost has been over $2,500,000.

SAINT PAUL, săn'pôl'. A seaport on the northwest coast of the French island of Réunion (q.v.), situated about 10 miles southwest of Saint-Denis. It is a good place of anchorage, contains a foundry, barracks, a college for priests, etc., and is connected by rail with Pointe-des-Galets. Pop., 1912, 18,646.

SAINT PAUL, sânt pąl'. The capital of Minnesota, in the southeast-central part of the State, on the Mississippi River, which forms the boundary between the city and Minneapolis, so the two are virtually one (Map: Minnesota, E 6). Total area, 56 miles.

The Mississippi here flows between banks from 100 to 200 feet high. The first terrace on either bank is occupied by railroad yards, the second by business, and the third by residences. The river scenery is among the most beautiful in the world. The Indian Mounds Park, overlooking the river from a steep bluff, has long been famous. This, with Como and Phalen, of 322 and 216 acres respectively, each surrounding a beautiful lake, and many smaller parks—in all a territory of 1600 acres—and with many miles of fine drives connecting them and extending beyond the city to a region of lakes, including White Bear, makes St. Paul a place of beauty and of varied recreation summer and winter. Principal buildings are the post office, city hall and courthouse, Pioneer Press, Endicott and Manhattan blocks, the State capitol, crowning a hill from which it can be seen for several miles in all directions, the magnificent Roman Catholic cathedral on another hill not far distant, the Public Library, Young Men's Christian Association, Auditorium, which houses the

St. Paul Institute, the stately old capitol home of the Minnesota Art Commission, St. Paul Hotel, and several business blocks, especially the Capitol and Merchants' banks, Lowry Building, and the Railway Exchange, the largest railroad office-building in the United States. St. Paul contains many State and public institutions, among which are the grounds of the Minnesota State Fair, the largest in America, with several pleasing buildings, including the live-stock pavilion and the grand stand that seats 25,000 people. Contiguous is the Agricultural School and Experimental Farm. The State law library of 75,000 volumes, the Minnesota Historical Society's library of 115,000 volumes and a complete file of Minnesota newspapers, and the Ramsey County medical library of 9000 volumes offer unusual advantages for research. Hamline University (Methodist), Macalester College (Presbyterian), St. Thomas College and St. Paul Seminary (Roman Catholic), Concordia College (German Lutheran), St. Paul's College (German Methodist), three Lutheran seminaries and the St. Paul College of Law yearly attract thousands of students. The public schools, in 61 buildings, including 4 high schools, one of which is devoted to mechanic arts, and a teachers' training school, enroll 25,000 pupils, and various private schools conducted by Roman Catholics, Jews, Lutherans, and others, 11,000 more. Twelve hospitals, the Children's Home and the Wilder Charity, the latter on invested funds of $2,778,000, provide for the ill and poor of the city.

Commerce. St. Paul has retained its great jobbing business developed during the days when its position as head of navigation gave it advantage, and is the home of some of the largest wholesale houses in America. It is the centre of an increasing business in cattle that in 1914 amounted to $40,000,000, and has the largest individual horse market in the United States. In publishing, especially of law books, in the manufacture of shoes, grass carpets, refrigerators, machinery, beer, and fur goods the city is preëminent. Altogether its industries are capitalized at $80,000,000. Its annual output is valued at $75,526,000. The city is the United States army headquarters for the entire northwest and the centre for the collection of internal revenue and customs. The Great Northern, Northern Pacific, and Chicago, St. Paul, Minneapolis, and Omaha railroads have main offices and shops here. Other railroads centring in St. Paul are the Rock Island, Burlington, Soo Line, Great Western, Chicago, Milwaukee, and St. Paul, and Minneapolis and St. Louis. By accommodating these roads with switching facilities the city has become a great transfer point for freight and passengers. Nearly 1,000,000 freight cars are handled annually at the Minnesota transfer, located in St. Paul. A passenger station and terminals to cost $10,000,000 were being constructed in 1915. St. Paul is becoming a centre for electric traction lines also, for four routes are open to the heart of Minneapolis and three others serve the excursionists and the gardeners to the south and east. Despite railroad competition the river still bears a considerable tonnage and a good excursion business. A high dam above the city is increasing this tonnage.

Finance. The bonded debt of St. Paul in 1915 was $11,059,000, the sinking fund $510,208.09. The assessed real valuation in that year was $84,329,473; personal, $30,078,612; in all $114,408,085. In 1914 the total receipts were $10,155,840.28, of which the regular budget for current expense used $5,662,231.09, general and special construction and improvement and special funds $4,315,592.09—a total of $9,977,823.18. On January, 1915, there was a balance of $178,017.10.

Population. On account of its favorable location St. Paul has grown rapidly. In 1850 there were 1112 inhabitants; in 1880, 41,473; but during the next 30 years the population reached 214,744 (census of 1910). The population in 1915 was estimated at 270,000; 1920, 234,595. Of this number 26.3 per cent were of foreign birth and 45.5 per cent of foreign parentage. Of the foreigners 30 per cent were Scandinavians, 24 per cent Germans, 23 per cent Russians and Austro-Hungarians, 19 per cent English, Scotch, and Irish, and the remaining 4 per cent chiefly French and Italians, with a sprinkling of Dutch, Belgians, Greeks, and Turks.

Government. St. Paul is governed by a commission according to a charter adopted in 1913. On the first Tuesday in May the mayor, comptroller, six commissioners, two municipal judges, three justices of the peace, and four constables are elected. The mayor is the president of the council and appoints each commissioner to the department for the direction of which that commissioner is held accountable, and can veto ordinances. The departments are finance; public works; public safety, including bureaus of health, fire, and police; parks, playgrounds, and public buildings; public utilities, including bureaus of water, markets, lighting, and control of utilities; and education. Under this last are the schools, library, and auditorium. The commissioner of education chooses a superintendent of schools. The council elects the city clerk and the corporation counsel. The mayor appoints the purchasing agent. Under this system the executive and legislative functions of government are to a great extent combined. The judicial department is free from council control.

St. Paul has made considerable advance in municipal ownership. It has constructed, at a cost of $8,000,000, a fine system of mains drawing spring water from several lakes north of the city. These lakes have a total watershed of 137 miles and supply the city with 14,000,000 gallons of water annually, distributed through 375 miles of mains. The city has an excellent system of sewers, 328 miles long. The city operates a public market. Thus, with an unusually good supervision over the food and health of the city, aided by the municipal and Wilder baths and by the 12 hospitals and the pure water obtainable, the death rate of St. Paul is only 9 per 1000 annually. The city owns and controls the auditorium, which seats 10,000 and is constantly in use as an educational and social centre.

History. The site of St. Paul was a favorite resort of the Indians, whose village, Kaposia, was near what is to-day known as Dayton's Bluff, a wall of white sandstone rising from the river to a height of 200 feet. This was called by the Indians Imnijiska (white rock). In this wall is the cave, rediscovered in 1913, near which in 1680 Father Hennepin was taken from the canoe of his captors to be led overland to Mille Lacs. In 1766 Carver explored it and made it the basis for the boundary lines of the famous grant which he obtained from the Indians and which has been vainly claimed by several of his

heirs. Later the name St. Peter's, first given to the Minnesota River and Mendota, was applied to what is now St. Paul. After the building of Fort Snelling in 1820 squatters settled on the site of the city, both for protection and for trade with the soldiers. After 1823 trading steamers made regular trips and landed at the settlement below the fort. In 1837 the opening of the Indian lands east of the Mississippi attracted settlers, notably a discharged soldier, Edward Phalen, after whom a lake has been named, and a French trader named Parrant, known, on account of a deformity, as Pig's Eye, who built a cabin in 1838. The town then became known as Pig's Eye. But in 1841 Father Galtier erected a log chapel on the present corner of Third and Minnesota streets, which he called St. Paul's, and after this the steamer landing was so designated.

The growth of the village was rapid upon the organization of Minnesota Territory in 1849, for its position on both the Mississippi and Minnesota rivers made it the natural capital. The influx of settlers to the new territory increased trade on both rivers. In 1854 the city received its first charter. In 1862 the St. Paul and Pacific operated its first train to St. Anthony (Minneapolis). In the eighties occurred the great boom which, before the decade had closed, trebled the population and more than trebled the territory of the city. After the panic of 1893 the city grew more slowly until the beginning of the new century, since when it has greatly increased in size and commercial power. Consult: J. F. Williams, *History of the City of St. Paul and County of Ramsey* (St. Paul, 1876); Warner and Foote, *History of Ramsey County and City of St. Paul* (ib., 1881); Andrews, *History of St. Paul* (ib., 1890).

SAINT PAUL (PAULUS). An oratorio by Mendelssohn (q.v.), first produced at Düsseldorf, May 22, 1836; in the United States, Oct. 29, 1838 (New York).

SAINT PAUL, ORDER OF. See DEATH, BRETHREN OF.

SAINT PAUL DE LOANDA, dȧ lō-än'dȧ, or LOANDA. The capital of the Portuguese West African colony of Angola (q.v.), situated on the coast (Map: Africa, F 5). Its harbor is rendered inaccessible to large vessels by the sandy bar at its mouth. Climate is unhealthful. The trade exceeds $5,000,000 per annum. Pop. (est.), 1913, 25,500, including some 1800 Europeans.

SAINT PAUL ISLAND. The principal island of the Pribilov group (q.v.), Alaska.

SAINT PAUL'S CATHEDRAL, in London. The largest and most magnificent of all Protestant churches and the most notable among English buildings of modern times. The site of the present building was occupied about 610 by a Christian church, probably of wood, dedicated to St. Paul, which was destroyed by fire in 1087. From its ruins arose a much more splendid edifice—the immediate precursor of the present cathedral, and commonly known as "Old St. Paul's." In 1139 the building suffered severely from fire, but was soon restored with greater magnificence, not finally completed till the latter part of the century. Old St. Paul's was the largest church in the country and the longest in Europe (nearly 600 feet). The cloister was 90 feet square, with a beautiful chapter-house in the centre.

In 1666 the great fire of London destroyed the old cathedral, which had twice previously suffered serious damage from lightning and had fallen into dilapidation. Sir Christopher Wren (q.v.) was at first directed to re-erect the ruined cathedral, but he opposed this course, and it was finally decided to abandon the effort and to clear away the site. The design at first prepared by the architect was disapproved by the clergy, and Wren was finally compelled to prepare a new design more nearly resembling Old St. Paul's in plan, and this design, having been approved by King Charles II, was carried out, though with many changes of detail. The edifice was begun in 1675 and completed in 1710 under Queen Anne, during Wren's lifetime.

The design thus executed was a compromise, and most of its defects arise from the incompatibility of the mediæval plan forced upon the architect, with its excessive length and small bays, and the Italian or classical style of architecture in which it was carried out. In spite of all defects, however, it is a noble edifice and one of the finest creations of modern times. The spacious rotunda, as wide as the nave and side-aisles together, well suited to accommodate a vast congregation, rests on eight piers, and as many arches alternately of 38 and 22 feet span. It is in the treatment of the smaller or intermediate arches that the chief infelicity of the interior architecture is found, two superposed arches taking up the vertical space occupied by one of the larger arches, but in a manner exceedingly awkward and unsatisfactory. The nearly equal length of nave and choir prevents alike the impression of a long unbroken vista, and of a predominantly central domical structure to which all else is subordinated. The total length is 490 feet; the internal width across the three aisles is 94 feet; the transepts are 240 feet over all (not including their columnar porches); the dome is internally 108 feet in diameter and 216 feet high to the lunette at the crown. Externally the dome is 370 feet high to the summit of the cross.

The constructive skill displayed is of the highest order; particularly bold was the conception of the brick cone which envelops the inner cupola and rises high above it to support the stone lantern which crowns the edifice. The inward contraction of the drum, devised partly for structural, partly for artistic reasons, is less successful. The outer shell of the dome is of wood, covered with lead. The effect of this dome is particularly successful, and it is admitted to be one of the finest in existence. It is the earliest example of a dome with a free-standing peristyle around the drum, later imitated in the Panthéon at Paris. The west front, as seen from Ludgate Hill, is most striking; the two campaniles group most harmoniously with the dome, and, together with the portico, produce a most pleasing and remarkable effect. This front is, however, open to criticism, as is also the second story of the flank of the exterior design. Both appear to indicate an upper story where there is none, and the actual construction and true form of the building are not expressed at all.

St. Paul's is the burial place of many heroes and men of distinction, whose tombs are in the crypt, and whose monuments adorn the interior of the cathedral. Among these are Nelson, Wellington, Collingwood, Moore, Howe, Roberts, and other celebrated soldiers and sailors; Reynolds, Barry, Opie, West, Sir Christopher Wren, the late Lord Salisbury, and other distinguished civilians. The style of many of these monuments

ST. PAUL'S CATHEDRAL, LONDON

displays those faults of ostentation and theatrical effect which are common in the sepulchral art of the eighteenth century, but a few among them show genuine artistic merit.

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SAINT PAUL'S SCHOOL. One of the nine great public schools of England. It was refounded in 1509 by John Colet, dean of St. Paul's, London. The first schoolhouse was erected in St. Paul's churchyard and was destroyed by fire in 1666. It has since been rebuilt, in 1674, and again in 1824. In 1884 new school buildings were erected at West Kensington, a suburb of London, on 16 acres of ground. The school now has an attendance of over 600 boys, taught by 34 masters. Among those who studied at the school were Milton, Judge Jeffreys, the Duke of Marlborough, and Major André. Consult M. F. J. McDonnell, *History of St. Paul's School* (London, 1909).

SAINT PAUL'S SCHOOL. A school for boys at Concord, N. H., incorporated in 1855. The founder was Dr. George C. Shattuck, of Boston, who transferred to the trustees his country home with 55 acres of land, near Concord. The religious teaching and worship are those of the Episcopal church. St. Paul's has an active Alumni Association of over 3000, two literary societies, and a missionary society, and maintains a monthly paper, the *Horæ Scholasticæ*, the oldest school paper in the country. The buildings include a fine Gothic chapel, the Sheldon Library, with shelf room for 40,000 books, gymnasium, laboratory, and dormitories. It has athletic fields covering 70 acres suitably equipped. In 1915 the students numbered 375, and the library contained 17,000 volumes. The rector in 1915 was Rev. Samuel Smith Drury, L. H. D.

SAINT PE'TER. A city and the county seat of Nicollet Co., Minn., 75 miles by rail southwest of Minneapolis, on the Minnesota River and on the Northwestern Railroad System (Map: Minnesota, C 6). It is the seat of Gustavus Adolphus College (Lutheran), opened in 1876, and has a State Hospital for the Insane, a State high school, and a public library. Its industrial plants include a flouring mill, furniture factories, a creamery, shirt and overall factory, grain elevators, cement plant, woolen mills, etc. Pop., 1900, 4302; 1910, 4176.

SAINT PETERPORT, commonly SAINT PETER'S or SAINT PIERRE. The chief town of Guernsey, Channel Islands (q.v.), defended by Fort George, on an overhanging hill, and by the historic Castle Cornet, built on a rocky islet now connected with the mainland by a breakwater (Map: France, N., C 3). The town rises in picturesque terraces on the east coast, and from its central position commands fine views of all the Channel Islands and the neighboring French coast. It carries on an important English and foreign trade, especially in locally grown market produce and fruit, and has commodious harbors with floating dock and building yard. The fine parish church is called the cathedral of the Channel Islands. Elizabeth College is a well-known educational establishment, and there are excellent markets, bathing places, parks, esplanades, and a well-equipped public library with museum, art, and technical schools. Hauteville House, the residence of Victor Hugo from 1855 to 1870, contains a collection of memorials of the poet. Pop., 1911, 18,756.

SAINT PE'TERSBURG, or **PETROGRAD.** A government of Russia (Map: Russia, C 3). Area, 17,226 square miles, exclusive of the water area, which occupies over 3500 square miles. The surface is mostly low. In the south are many lakes, streams, and marshes. The principal rivers are the Narova, the Neva, and the Volkhov. There is also an extensive canal system. (See LADOGA.) The climate is moist and unsteady. The economic activity of the government is influenced greatly by St. Petersburg (Petrograd), the capital, and by the numerous summer resorts. The raising of cereals is inferior in importance to gardening and dairying, and there are few manufacturing industries outside of the capital and its suburbs and Kronstadt. Estimated population, Jan. 1, 1913, 3,079,100, including a considerable number of persons belonging to the Finnic race.

SAINT PETERSBURG, or **PETROGRAD.** The capital of the Russian Empire, situated on the delta of the Neva and at the eastern end of the Gulf of Finland, 400 miles northwest of Moscow (Map: Russia, D 2). The main part of the city, renamed Petrograd in 1914, lies on the left bank of the Neva. The remaining portion occupies the numerous islands formed by the arms of the stream. The low situation of St. Petersburg makes it liable to frequent inundations, caused usually by strong western winds which prevent the discharge of the waters of the Neva. The construction of canals and the granite embankments, however, have greatly alleviated the situation. The Neva, with its arms and tributaries, is spanned by numerous bridges, of which the most prominent are the *Troitsky*, the Alexander, the Palace, and the Nicholas.

The climate is very changeable, and on the whole unpleasant. The severe periods of cold during the winter are tempered by warm westerly gales which raise the mean temperature above that of Moscow. The summers are hot and short, and the autumns usually cold and damp. The mean temperature is about 15° F. in winter and about 64° in summer. The percentage of cloudiness is nearly 70.

Topography. The main part of the city, on the left bank of the Neva, is regularly laid out in modern European style. Along the river are situated palaces and costly private residences, as well as the imposing Admiralty, surrounded by a beautiful garden. From the Admiralty, which stands in the centre of the city, radiate three long avenues: the splendid and fashionable *Nevsky Prospekt*, the *Voznesensky Prospekt*, and the *Gorokhovaya Ulitza* (street). The principal squares of this part of St. Petersburg are the Senate Square, with the famous equestrian statue of Peter the Great erected by Catharine II in 1782; the Palace Square, with the Alexander Column—a great monolith of red granite, surmounted by the figure of an angel; and the Field of Mars, an immense parading ground embellished with a statue of Suvarov. The pretentious monument to Catharine II stands in front of the Anitchkov Palace, and the equestrian

statue of Nicholas I in front of the Mariynsky Palace. In its architecture St. Petersburg presents few striking features to Western eyes, although some of its palaces and churches are imposing in appearance.

The impressive Cathedral of St. Isaac (1768–1858) is built in the shape of a Greek cross with gilded cupolas, magnificent peristyles, and fine columns of porphyry, malachite, and lapis-lazuli. Other prominent churches are the Cathedral of Our Lady of Kazan (1801–11), an imitation of Saint Peter's, with a richly ornamented interior, and the Cathedral of Sts. Peter and Paul (1712–33), in the fortress of the same name, and containing the remains of the Russian monarchs since the time of Peter the Great; and the Alexander Nevsky Monastery in the eastern part of the city, the burial place of many of the most prominent literary men, composers, and artists of Russia.

Of the well-known palaces of St. Petersburg (some of which contain great art treasures), the most notable is the Winter Palace—a vast structure in mixed style facing the Neva. It dates from the reign of Empress Elizabeth (1741–62) and was rebuilt after the fire of 1837. It contains a number of magnificent halls decorated with war trophies, portraits of famous generals, and historical paintings. Other interesting palaces are the *Anitchkov*, the residence of the heir apparent, the *Mikhailovsky*, the Marble Palace, and the Taurida Palace, built by Catharine II for Potemkin. Noteworthy public buildings besides the Admiralty are the General Staff, the Senate, the *Gostinny Dvor*, and the old Mikhailovsky Palace (now used as a school of engineers).

Connected with the mainland by the Troitsky Bridge is a small island occupied by the renowned fortress of Sts. Peter and Paul, the nucleus of the capital and used as a State prison. On the Vasilevsky Island are the exchange and the most important educational institutions, including the university. The Peterburgsky Island is principally a residential section. The Aptekarsky Island has magnificent botanical gardens. The remaining islands are covered with numerous parks and private gardens, and have many summer residences. There are also a number of summer resorts along the right bank of the Neva, while the mainland north of its main arm is occupied by industrial establishments and workingmen's dwellings.

St. Petersburg has a unique system of markets and trading centres, in which nearly all of the retail trading is carried on. There are 12 of the former and 2 of the latter, all belonging to the city and constituting a source of profit to the municipal treasury. In the two trading centres called *Gostinny Dvor* and *Apraxine Dvor*, well known all over Russia, chiefly clothing and footwear are sold. In the markets all sorts of foodstuffs constitute the chief article of trade.

Educational Institutions, Collections, and Charities. St. Petersburg is the intellectual centre of Russia. It is more influenced by western civilization than any other Russian city. Besides the university (see SAINT PETERSBURG, UNIVERSITY OF) there are the Technological Institute, the Military Academy of Medicine, the Military Academy of Law, the Nicholas Military Academy, the institutes of forestry, mining, and civil engineering, the Imperial Historico-Philological Institute, the Alexander Lyceum, the Greek Orthodox and Roman Catholic academies, the "corps of pages," and the archæological institute.

There are also institutions for the higher education of women in medicine, philosophy, and the exact sciences. Among the special schools mention should be made of the conservatory of music, founded and for a time directed by Rubinstein. The Imperial Public Library (2,044,000 books, 21,900 maps, 102,120 engravings and photographs, and 124,000 manuscripts) is one of the largest in the world, ranking fifth in 1914. Its nucleus is the Zaluski Library, which was seized by Suvarov at Warsaw in 1794. Other important libraries are those of the Academy of Sciences (about 500,000 volumes and over 13,000 manuscripts) and the University (over 453,000 volumes). There are also a number of interesting and important archives in charge of the Holy Synod and the various Ministries. The Hermitage, with over 1700 canvases, contains one of the most prominent galleries of paintings in the world, housing, as it does, the chief Imperial art collections. The Flemish and Dutch schools (including some 40 Rembrandts), the Spanish school (with, especially, the works of Velazquez and Murillo), and the French school (with its Claudes) are richly represented. The Hermitage has also an important collection of sculptures, an extensive collection of Scythian, Greek, Egyptian, Assyrian, and Russian antiquities, collections of engravings and coins, and a valuable library. The Academy of Art contains a valuable array of Russian paintings and works of modern French landscapists. The Alexander III Museum, opened in 1895, is devoted chiefly to old Christian and old Russian works of art. The most noteworthy of the scientific societies are the Academy of Sciences, to which are attached the observatories at Pulkova (q.v.) and Vilna, and the botanical gardens; the Russian Geographical Society, with branches in Siberia and the Caucasus; the Russian Historical Society; the Archæological Society; the Physico-Chemical Society; and the Free Economic Society.

There are over 300 philanthropical societies, maintaining more than 600 charitable institutions, including about 150 asylums for children, some 90 poorhouses, and about 100 dispensaries and nurseries; also model tenements, lodging houses, etc. The hospitals are maintained mostly by the central government and the municipality. In 1913 the city made a special appropriation of $35,100,000 for various municipal improvements, including the extension of the electric-car lines, hospital improvements, and the installation of refuse destructors. The same year a new cold-storage plant, the largest in Russia, was opened. Electric lighting and improvement of the city's water supply are among the other municipal improvements under way.

Commerce and Industry. The capital with its suburbs forms one of the largest manufacturing centres of Russia, being second only to the industrial region of Moscow. Of special importance are the textile, metal, and rubber industries. Important also are the tobacco, leather, and various stone products. These, however, represent only part of St. Petersburg's industrial activity, since there are a very large number of small industrial establishments, engaged mostly in the production of food products, articles of apparel, small metal and wooden wares, leather goods, etc.

In the early part of the nineteenth century

St. Petersburg controlled over 50 per cent of the total foreign trade of Russia. During the last quarter of the nineteenth century, however, the total trade of St. Petersburg absolutely decreased, although the imports show a considerable absolute increase. In 1913 the shipments from St. Petersburg were valued at about $60,000,000; its imports for the same year at about $81,000,000. The principal exports are agricultural and dairy products and lumber; the imports include coal, metals, various foodstuffs, and manufactures. By the opening of the sea canal to Kronstadt in 1885 the port of St. Petersburg has been made accessible to the largest vessels. In 1912, in accordance with a general government plan, vast harbor improvements were begun. St. Petersburg is the strongest financial centre of Russia and an important one in Europe. Its principal financial concerns are the Imperial Bank, the International Commercial Bank, the Asiatic Bank, and the St. Petersburg Discount Bank.

Administrative and Municipal Functions. The administration is largely in the hands of the central government. There is, however, a municipal council elected every four years by a very small number (about 7000) of property-owners. The municipality and the central government own most of the public utilities, including the water-works, the street railway lines, the ferries, docks, and harbors, and the telephone lines. The annual budget balances at over $9,000,000. The revenue is derived principally from taxes on real estate and on business, and from the income on municipal property and undertakings. The principal expenditures are on education, service of the debt, maintenance of public works, and charities.

Population. The population increased very rapidly during the nineteenth and the early twentieth centuries. In 1784 it was 192,000; in 1800, 220,000; in 1864, 539,122; in 1897, 1,264,920; in 1908, 1,870,000; and in 1912, 2,018,596, including 11,200 Germans, 2400 Frenchmen, and 2100 Englishmen. Population of 1915, 2,318,645. It ranks fifth among the cities of Europe and is the most important commercial town on the Baltic Sea. Among the peculiar features of the population are the large proportion of persons born outside of the city (about two-thirds of the total), the excess of the male sex (100 males to 88 females in 1910), and the predominance of the peasant class, which constituted over one-half (61.4 per cent) of the total in 1910. The Russians form about 90 per cent of the population. The death rate was 27 per thousand in 1886–95, 24 in 1905. The percentage of illegitimate births is 24.1 per cent.

History. In 1300 the Swedes founded at the mouth of the Neva the settlement of Landskrona, which was destroyed by Novgorod (q.v.) in the following year. During the fourteenth century a number of settlements were founded along the river by Novgorod. The territory remained in the possession of that city and later of Moscow until the seventeenth century, when the Swedes succeeded in recovering the region around the mouth of the Neva, and founded the town of Nyön, at the junction of the Okhta with that river, and the fortress of Nyönschanz on the opposite shore. In 1703 the fortress was taken by Peter the Great, who in the same year laid the foundations of the fortress of Sts. Peter and Paul, the nucleus of the future capital. The foundation of St. Petersburg marked a revolution in the history of Russia, as it signalized the definite assumption by that Empire of a place among the Baltic Powers, and its entrance upon the stage of Western politics. With his usual directness and energy Peter I divided the supervision of the work of building the city between himself and his lieutenants, and by 1712 sufficient advance had been made to permit the transfer of the royal family from Moscow. Thousands of peasants were ordered from the rural districts to the new capital, and a special tax was imposed to meet the expenses. A scarcity of masons was met by an order forbidding the erection of stone buildings throughout the rest of the Empire, and all proprietors of over 500 serfs were compelled to build residences in the new capital and spend the winter season there. During the reigns of Catharine I and Peter II the Russian population of the capital decreased considerably. Anna Ivanovna revived many of the measures of Peter I, and Elizabeth Petrovna, following the policy of her predecessor, greatly increased the population of the capital and added much to its architectural beauty. Catharine II also took great interest in the growth of Saint Petersburg, and enriched it by many beautiful palaces, some of them intended for her favorites. At the end of the eighteenth century the population of the city increased by more than 200,000, and during the reign of Alexander I, when the marshes were drained, the population doubled. During the reign of Nicholas I, St. Petersburg was connected by railways with Moscow and all important points of the Empire. In recent times, the city has become not only the governmental and administrative, but also the intellectual and social centre of the Russian Empire. At the outbreak of the War of 1914, the name of the city was changed to Petrograd, which is the old Russian expression meaning the city of Peter. See WAR IN EUROPE.

Consult: Hafferberg, *Petersburg in seiner Vergangenheit und Gegenwart* (St. Petersburg, 1866); Elaroff, *Saint-Petersbourg et ses environs* (ib., 1892); George Dobson, *Saint Petersburg* (New York, 1910); W. B. Stevens, *Petrograd, Past and Present* (Philadelphia, 1916).

SAINT PETERSBURG. A city in Pinellas Co., Fla., 21 miles by water south of Tampa, situated on the peninsula separating Tampa Bay from the Gulf of Mexico, on the Atlantic Coast and the Tampa and Gulf Coast lines (Map: Florida, D 4). Its water front is an excellent beach and there is a beautiful, wide, and deep harbor, used for commercial and recreational purposes. St. Petersburg has adopted the commission form of government. Pop., 1900, 1575; 1910, 4127; 1920, 14,237.

SAINT PETERSBURG, DECLARATION OF. An agreement between the Great Powers by which harsh conditions of war were to be mitigated. In December, 1868, a conference of delegates representing Austria-Hungary, Bavaria, Belgium, Denmark, France, Great Britain, Greece, Italy, the Netherlands, Persia, Portugal, the North German Confederation, Russia, Sweden, Norway, Switzerland, Turkey, and Württemberg was held at St. Petersburg, upon the invitation of the Russian government, for the purpose of considering the existing rules of war with the view of ameliorating the hardships of warfare. A declaration was agreed upon and signed by the delegates present affirming that the only legitimate object of war should be to weaken the military force of the enemy, which could be sufficiently accomplished by disabling the great-

est possible number of men, which object is exceeded by the employment of arms that uselessly aggravate the sufferings of disabled men or render their death inevitable. The employment of such arms was declared to be contrary to the laws of humanity in view, and consequently the signatory Powers agreed to renounce in case of war among themselves the use of any explosive projectile of less weight than 400 grams (14 ounces avoirdupois) or one charged with fulminating or inflammable substances. The United States took no part in this convention and has never acceded to it.

SAINT PETERSBURG, University of. An institution which had its inception in the teachers' institute established under Catharine II, although Peter the Great previously planned the establishment of a university in his new capital. In 1803 the budget for a contemplated university was confirmed by Imperial edict. The teachers' institute was known as the Pedagogical Institute from 1804 to 1816, when it was reorganized as the Higher Pedagogical Institute, with 27 teachers, divided into the sections of philosophy-jurisprudence, physics, mathematics, and history-literature. At the same time it received the right to confer degrees, and was thus placed practically on a university basis. In 1819 an Imperial edict transformed the institution into a university. The university consists of the following faculties: (1) history-philology, (2) physics-mathematics, (3) law, and (4) Oriental. The attendance in 1913 was 7455. The library contained 231,340 works in 453,772 volumes, and a collection of more than 9000 manuscripts, including a large number on Chinese literature. The university includes, among other institutes, the Museum of Fine Arts and Antiquities, a large collection of coins, astronomical and meteorological observatories, and a botanical garden.

SAINT PETER'S CHURCH, at Rome. The largest Christian place of worship. It is closely connected with the Palace of the Vatican and in this capacity it has always been used, especially for the great festivities of the Church. The present church succeeded the Basilica of San Pietro in Vaticano, one of the original fourth-century basilicas of Rome and the largest of all. This is still the official title of the church and distinguishes it from the other churches in Rome which are dedicated to St. Peter. The plan and general character of the old basilica are preserved in the drawings engraved for the folio volume prepared to illustrate Bunsen's *Die Basiliken des christlichen Rom* (1843) and the series of Letarouilly's *Le Vatican et St. Pierre.* It was a five-aisled basilica, with a large forecourt or atrium, and a baptistery and some other minor structures attached to the building. During the long residence of the popes at Avignon (1309–1376) the basilica was much defaced and partly ruined, and it appears to have been about 1450 that Pope Nicholas V undertook its rebuilding in the taste of the time. A design was made by Bernardo Gambarelli, more commonly called Rossellino, but of this design very little was ever put into execution.

The first Pope to take up the work with vigor was Julius II (1503–13), who employed Bramante to make an entirely new design for the church. His design provided a cruciform nave, choir, and transepts with equal arms, and a great central cupola around which a complex series of chapels and porches were grouped. He died in 1514 and was followed by a long series of architects, among whom were Raphael, Giuliano da Sangallo, Peruzzi, Antonio da Sangallo, and others, who produced a marvelous series of plans and models, but accomplished little actual building except the strengthening of Bramante's inadequate piers. Antonio da Sangallo's model for the church, with a grandiose porch and piers, is still preserved. In 1546 the work was put by Paul III into the hands of Michelangelo Buonarroti, who followed the main lines of Bramante's work, but wholly redesigned the dome and exterior details. (See Michelangelo.) He carried up the edifice as far as to the springing of the great cupola and made a model in wood of the cupola itself, which is preserved and which was very closely followed in the actual construction. After his death in 1564 the cupola seems to have been carried on and completed about 1590 under the direction of Giacomo della Porta and Domenico Fontana. In 1606, under Paul V, Maderna began the addition of two bays and a narthex to the nave, with the present façade, which he completed in 1626. The great colonnades inclosing the Piazza di San Pietro, one of the most effective compositions of the late neoclassic style, were carried out by Bernini (q.v.) about the middle of the seventeenth century.

The addition made by Maderna to the church is in itself an enormous building. His new front, on the Piazza di San Pietro, is universally criticized as commonplace and out of scale; but it could be endured were it not that, in consequence of his lengthening of the nave, one has to be half a mile from the church in order to see the cupola aright from the east. The great Piazza di San Pietro, about 1000 feet long, does not give nearly sufficient opportunity to retire from the front in order to see the cupola. Thus the most important part of the church can be seen aright only from the papal gardens. From a point well chosen in that region the huge cupola rises nobly from its substructures, themselves enormous in scale, and the whole group, the mass, the artistic conception embodied in these gigantic combinations of cut stone, is in its main outlines one of the finest conceptions of modern times. The height to the top of the cross on the dome is 435 feet.

The interior of the church is disfigured by exaggerated ornamentation and staring contrasts of color. Thus, when one enters the church for the first time the most plainly visible thing is apt to be the adornment of the great piers by white cartouches on the dark marble surface. Moreover, the great proportions of the building are dwarfed by the enormous scale of its component parts, which are too few and too huge to be easily measured by the eye or compared with the human figures as a norm of their dimensions. The proportions of the interior, though far from perfect, are, on the whole, however, still to be received as in accordance with a fairly rational architectural tradition. The church grows on the spectator continually, and the effect of the great cupola when seen from within is one of the most impressive pieces of architectural decorative work in existence.

The church is crowded with altars, mosaics, tombs, shrines, statues, fonts, and other works of art, insomuch that it forms a museum of the sculpture and the architectural decorative work of three centuries. The most prominent of the accessory structures inside the church is the great bronze baldachino, as lofty as most church towers and covering the high altar. Beneath

ST. PETER'S CATHEDRAL AND PART OF THE VATICAN
FROM A PHOTOGRAPH

this is a shrine or confessionary. The crypt has been carefully guarded through all the change of plan and through the centuries of constantly renewed work on the building. It contains many precious monuments and fragments of the original basilica of St. Peter, of which it marks the level, 10 or 12 feet below that of the modern church. Consult: Heinrich von Geymüller, *Les projets primitifs pour la basilique de Saint Pierre de Rome* (Paris, 1880); Letarouilly and Simil, *Le Vatican et la basilique de Saint Pierre à Rome* (2 vols., ib., 1882); A. S. Barnes, *St. Peter in Rome and his Tomb on the Vatican Hill* (London, 1900).

SAINT PETER'S COLLEGE. A college at Cambridge, England, commonly called Peterhouse, the oldest college in the university. It was founded in 1284 by Hugh de Balsham, Bishop of Ely, for a master and 14 fellows. It was the outgrowth of an attempt by the Bishop to introduce certain secular scholars into the Hospital of St. John in 1280. This ended in the transfer of those scholars to certain hostels near the church of St. Peter, which was impropriated to the new foundation and gave it the name it bears. (See SAINT JOHN'S COLLEGE.) Peterhouse consists of a master and 8 fellows, lecturers, tutors, and officers, honorary fellows, 17 scholars, and 6 exhibitioners, and some 80 undergraduates in all. There are 11 livings in the gift of the college. Consult T. A. Walke, *Peterhouse College* (London, 1901).

SAINT-PIERRE, săn'-pē'âr'. A seaport on the south coast of the French island of Réunion (q.v.), connected by rail with Saint-Denis, the capital. It has lost its commercial importance since the opening of the Port des Galets, but has a number of sugar mills and canning establishments. Pop., 1912, 29,481.

SAINT-PIERRE. Previous to 1902 the most important and flourishing city on the island of Martinique (q.v.), French West Indies (Map: West Indies, G 4). It lay at the head of an open bay on the northwest coast of the island and at the foot of Mont Pelée. On May 8, 1902, the entire city and the neighboring hamlets were destroyed by an explosive eruption of Mont Pelée. (See PELÉE, MONT.) The entire population of the city perished, the number of victims, including those in the surrounding districts, being estimated at 30,000. Only two persons actually in the city at the time of the eruption escaped death.

SAINT-PIERRE, JACQUES HENRI BERNARDIN DE (1737–1814). A French novelist, essayist, and engineer, born at Havre and educated at Caen. He made a voyage to Martinique, became an engineer, entered the army, was dismissed for insubordination, and for some years led a wandering life, appearing at Malta, St. Petersburg, Warsaw, Dresden, and Berlin. In 1765 he went to Paris and essayed literary work, but in 1768 he obtained a government post in Ile de France, where he remained till 1771. On his return he associated much with Rousseau, on whom he modeled his character and his style. For the rest of his life he remained in France, publishing *Voyage à l'Ile de France* (1773); *Etudes de la nature* (1783–88); *Paul et Virginie* (1787); *La chaumière indienne* (1790). His *Harmonies de la nature* appeared posthumously. In 1792 he became superintendent of the Botanical Garden of Paris. He was professor of morals at the Normal School in 1794 and became a member of the Institute in 1795. Saint-Pierre's significance lies solely in the realm of imagination and sentiment, which is often childlike, sometimes childish. *Paul et Virginie* came at the right moment. Cloyed with wit, the Parisian literary generation of that time sought refuge in feeling. Saint-Pierre entered into the heritage of the novelist Rousseau, receiving and transmitting more of his romantic sentiment and sympathy with nature than any other. *Paul et Virginie* attempts to realize Rousseau's "state of nature" in a tropical Arcadia, and the death of the heroine comes just in time to save the idyl of innocent childhood from the sickly sentimentality on whose verge it often hangs trembling. Stylistically Saint-Pierre's influence has been very great. He was the first in France to treat landscape, with intent, as the background of life. Saint-Pierre's *Works and Correspondence* were edited with a *Life* by Aimé Martin, who married his widow (Paris, 1818–20). Consult: Arvède Barine, *Bernardin de Saint-Pierre* (Paris, 1891; Eng. trans., Chicago, 1893); Adolphe de Lescure, *Bernardin de Sainte-Pierre* (ib., 1891); Fernand Maury, *Etude sur la vie et les œuvres de Bernardin de Saint-Pierre* (ib., 1892).

SAINT-PIERRE, JACQUES LEGARDEUR DE (1698–1755). A French soldier and explorer, born in Normandy in 1698. He entered the French service as an ensign of marines and was shortly afterward sent to Canada. In 1750 he was sent to explore the Northwest and to search for a route to the Pacific. He ascended the Saskatchewan River to a place he called Rock Mountain and there built Fort La Jonquière. Soon after his return to Quebec in 1753 he was ordered to the Ohio valley region and in 1754 was commander of Fort Le Bœuf on French Creek. In the following year Saint-Pierre commanded the Indian allies in Dieskau's expedition into New York, and was killed in the battle of Lake George. An account of his explorations in the West, entitled *Journal sommaire du voyage de Jacques Legardeur de Saint-Pierre, chargé de la découverte de la Mer de l'Ouest,* is preserved in the British Museum and was published in the collection of John Gilmary Shea (New York, 1862). Consult Francis Parkman, "A Half-Century of Conflict," in *France and England in North America,* part vi (2 vols., Boston, 1903).

SAINT-PIERRE AND MIQUELON, mē-ke-lôn'. A French colony, 10 miles off the south coast of Newfoundland, consisting of several islands, with a total area of 93 square miles (Map: Newfoundland, D 6). Miquelon consists of Grand Miquelon and Little Miquelon, which are connected by the sand-dune isthmus of Langlade; area, 81 square miles. Saint-Pierre, together with the small Ile-aux-Chiens and other islets, has an area of 12 square miles. The islands are barren and, excepting Little Miquelon, rocky, but are of great importance as the centre of the French cod fisheries. The French fishing fleet in 1914 numbered 227 vessels, with 6736 men. About one-half of the imports come from France and about five-sixths of the exports, mainly dried cod, go to France. In 1912 imports and exports were valued at 5,179,000 and 6,003,000 francs respectively. Saint-Pierre, the capital (pop., 1911, 3403), has cable connection with Europe and America and regular steam communication with Boston and Halifax. The colony is under an administrator and is represented by a deputy in the French Chamber. Pop., 1897, 6352; 1911, 4209, of whom 357 were foreigners. The islands were ceded to Great

Britain by France together with Newfoundland in 1713, but were recovered at the conquest of Canada, and after changing hands several times finally returned to France in 1816.

SAINT-POL-DE-LÉON, săn'-pôl'-de-lā'ôn'. A town in the Department of Finistère, France, half a mile from its port, Rempoul, on the English Channel, and 13½ miles by rail northwest of Morlaix (Map: France, N., A 4). It is noted for a Romanesque-Gothic church, formerly a cathedral, dating from the twelfth century, with two granite spires 180 feet high, and for the fourteenth-century Chapelle de Notre Dame de Creizker, with a fine central tower and spire 255 feet high. The town was an episcopal see from the sixth century until the suppression of the bishopric in 1790. Pop., 1901, 7846; 1911, 8140.

SAINT-PORCHAIRE, pôr'shâr', Pottery of. A famous ware first examined and recorded about 1830 and entitled Faïence Henri Deux, because of the occurrence in its ornamentation of the letter H and crescents which were supposed to be the badge of Diane de Poitiers. Only about 90 pieces are known to exist, of which one or two are in Russia and the remainder are about evenly divided between France and England. Of these South Kensington Museum, the Louvre, and the Musée de Cluny, Paris, each contains several perfectly representative specimens. The J. P. Morgan collection (Metropolitan Museum, New York) possesses seven pieces, the largest number owned privately. The peculiarity of the pottery is that its decorations are almost entirely by incrustation, pieces of dark red or dark brown clay inlaid in the yellowish white of the body. The shapes have been cut out by little dies strongly resembling bookbinders' stamps, and after the incrustation has been made the whole has been brought to a smooth surface and covered with a thin transparent glaze. Enamels are used with great moderation.

SAINT-PRIVAT, prē'vå', Battle of. A name often given to the battle of Gravelotte (q.v.).

SAINT-QUENTIN, kăn'tăn'. The capital of an arrondissement in the Department of Aisne, France, 95 miles north by east of Paris, on the Somme River (Map: France, N., J 3). One attraction of the town is the church of St. Quentin, which dates from the twelfth century. It is a Gothic structure, with highly adorned interior. The hôtel de ville, a fourteenth-century edifice, with its curiously constructed council hall, is also noteworthy. Saint-Quentin is of considerable industrial importance, as is the surrounding region. The leading products are cotton and woolen textiles, sugar, engines, billiard balls, machinery, etc. Pop., 1901, 50,278; 1911, 55,571. The Roman name for Saint-Quentin was Augusta Veromanduorum. It suffered greatly from the attacks of the Northmen during its early history. Here on Aug. 10, 1557, the Spaniards under Emmanuel Philibert of Savoy won a great victory over the French under the Constable de Montmorency, and here on Jan. 19, 1871, the Prussians administered a crushing defeat to the French under Faidherbe. The city again fell into German hands in August, 1914. It was later bombarded by French airmen. See War in Europe.

SAINT RAYMOND, săn rā'mŏn; *Anglicized,* sånt rā'mŭnd. A village in Portneuf County, Quebec, Canada, situated on the Quebec and Lake St. John and the Canadian Northern railways, 35 miles west of the city of Quebec by rail (Map: Quebec, J 5). It is the seat of St. Raymond College and a Roman Catholic convent. Pop., 1911, 1653.

SAINT RE'GIS. A settlement of Catholic Iroquois on the south bank of the St. Lawrence River, on both sides of the boundary line between Canada and the United States, being partly in Huntingdon County, Quebec, and partly in Franklin Co., N. Y. The Iroquois name is Akwesasne. The village was established about the year 1755 by a party of Catholic Iroquois from Caughnawaga, Quebec. Being chiefly of Mohawk descent, the Indians all speak that language. They are expert basket makers. They number in all about 2500, of whom 1219 are on the American side. See Iroquois.

SAINT-RENÉ TAILLANDIER. See Taillandier, R. G. E.

SAINT RO'NAN'S WELL. A novel by Scott (1824), a picture of life at a small watering place.

SAINTS. See Saint.

SAINTS, Litany of the. See Litany.

SAINT-SAËNS, săn'sänș', (Charles) Camille (1835–1921). A French composer, born in Paris, Oct. 9, 1835. At the age of seven he began the study of piano under Stamaty, in 1847 he joined Benoist's class at the Conservatory, and in 1849 he won the second and in 1851 the first organ prize. He competed unsuccessfully for the Prix de Rome, but secured the appointment of organist of the church of Saint-Merri (1853). This post he resigned in 1858 to become organist of the Madeleine, where he remained till 1877. After 1870 he devoted himself chiefly to composition, concert, and recital work. Saint-Saëns's first important compositions were the symphonic poems *Phaéton, Le rouet d'Omphale, Le jeunesse d'Hercule,* and *La danse macabre,* which last was especially popular. His operas have been the least successful of all his works, although they bear strong evidence of his originality and genius. With Massenet he shared the reputation of being the most classical French composer of his generation. His instrumentation, which shows the influence of Berlioz, is strikingly brilliant and original. He became a member of the Institute in 1881, was made Commander of the Legion of Honor in 1884, and received honorary degrees from Oxford and Cambridge. In 1906 he visited the United States, where he created a furore by his marvelous improvisation on the organ. In 1915 he was sent by the French government as a commissioner to the Panama-Pacific Exposition, where he was guest conductor of a series of concerts. In honor of the exposition he composed a fantasia, *Hail, California.* His works include, besides those already mentioned: the operas *La princesse jaune* (1872); *Le timbre d'argent* (1877); *Samson et Dalila* (1877); *Etienne Marcel* (1879); *Henry VIII* (1883); *Proserpine* (1887); *Ascanio* (1890); *Phryné* (1893); *Frédégonde* (first three acts by Guiraud, last two by Saint-Saëns, 1895); *Andromaque* (1903); *L'Ancêtre* (1906); ballets and incidental music; three symphonies, an oratorio, *Noël;* several concertos for piano, violin, and cello; two masses; a requiem; considerable chamber music; pieces for organ and piano; and songs. Together with Malherbe he edited the great edition of Rameau's works. Consult: O. Neitzel, *Saint-Saëns* (Berlin, 1899); D. G. Mason, *From Grieg to Brahms* (New York, 1902); E. Baumann, *L'Œuvre de Saint-Saëns* (Paris, 1905).

SAINTSBURY, George Edward Bateman (1845–). An English critic and literary historian, born at Southampton, Oct. 23, 1845, and educated at King's College School, London, and at Merton College, Oxford. He was classical master in Elizabeth College, Guernsey (1868–74), and head master of Elgin Educational Institute (1874–76). He settled in London as a journalist and miscellaneous writer (1876–95), but thereafter until his retirement in 1915 was professor of rhetoric and English literature in the University of Edinburgh. He received honorary degrees from Aberdeen, Durham, and Oxford, was president of the English Association in 1909, and became fellow of the British Academy. The range of his reading in classical, mediæval, and modern literature was immense, his industry extraordinary; and the sheer bulk of his work, original and editorial, is a monument to a literary enthusiasm which never tired and which imparted remarkable zest, vitality, and readableness to themes which might in other hands have proved dreary enough. Among his numerous publications are a *Primer of French Literature* (1880); *Dryden*, in "English Men of Letters" (1881); *Short History of French Literature* (1882); *Marlborough* (1885); *Elizabethan Literature* (1887); *Essays in English Literature, 1780–1860* (1st series, 1890; 2d series, 1895); *Essays on French Novelists* (1891); *Nineteenth Century Literature* (1896); *The Flourishing of Romance and the Rise of Allegory* (1897); *Sir Walter Scott* (1897); *A Short History of English Literature* (1898); *Matthew Arnold* (1899); the exhaustive *History of Criticism and Literary Taste in Europe* (3 vols., 1900–04); *The Earlier Renaissance* (1901); *Minor Poets of the Caroline Period* (1905–06); *History of English Prosody* (3 vols., 1906–10); *The Later Nineteenth Century* (1908); *Historical Manual of English Prosody* (1910); *History of English Criticism* (1911); *History of English Prose Rhythm* (1912); *The English Novel* (1913); *First Book of English Literature* (1914).

SAINT-SERVAN, sĕr'vän'. A seaport in the Department of Ille-et-Vilaine, north France, less than a mile from Saint-Malo (Map: France, N., D 4). It is mostly a modern town with a handsome town hall and a triangular tower of the seventeenth century. Pop., 1901, 12,597; 1911, 12,242.

SAINTS' EVERLASTING REST, The. A religious work by Richard Baxter (1650), used by many generations as a devotional book. Its clear and beautiful style and the manly vigor of its piety have made it an English classic.

SAINT-SIMON, săn'-sē'môn', Claude Henri, Count de (1760–1825). A French Socialist. He entered the army at 16, and came to America, where he served with distinction in the campaign against Cornwallis. On his return to France he was made colonel, but in 1785 he resigned from the military service and traveled extensively in Holland and Spain. He had already conceived his mission in life to be "to study the progress of the human mind in order to work thenceforth for the perfecting of civilization." He took little part in the great revolution of 1789, but, though a noble himself, voted to abolish titles of nobility. He made a considerable fortune during this period by purchasing the confiscated estates of the émigrés. His fortune was soon exhausted by his extravagance, and he was obliged to work as a copyist. His family finally settled upon him a small pension. In 1823 he attempted suicide. Supported by his friends, he devoted himself again to his propaganda and succeeded in gaining numerous disciples, the most famous of whom were Augustin Thierry and Auguste Comte. He died in 1825.

The chief doctrines of Saint-Simon are as follows: 1. The rules of science should be applied as rigorously to the study of social facts as to the study of facts of a physical nature. 2. Through true science thus applied the condition of humanity, and especially of the poorest class, can be improved, mentally, physically, and morally. 3. To industry, the ensemble of producers, should be given the political power heretofore held by the proprietary and military classes. 4. Society should be reorganized, taking labor for the basis of the entire hierarchy. 5. To this new society only producers should be admitted and idleness should be proscribed. 6. In this society workers should be rewarded according to merit. 7. Laborers must unite and centralize their social forces in order to attain their common end. 8. The three institutions, religion, the family, property, must all be reorganized upon new bases. These doctrines were further developed by the followers of Saint-Simon into the social philosophy called after its founder Saint-Simonianism. This school of Socialism insists especially upon the abolition of the law of inheritance, upon the socialization of the instruments of production, and upon a system of distribution based upon the merits of the individual.

The following are the principal works of Saint-Simon: *Lettre d'un habitant de Genève à ses contemporains* (1802); *Introduction aux travaux scientifiques du XIXème siècle* (1807); *Réorganisation de la société européenne* (1814); *L'Industrie, ou discussions politiques, morales et philosophiques* (1817); *Du système industriel* (1821–22); *Catéchisme des industriels* (1822–23); *Opinions littéraires, philosophiques et industrielles* (1825); *Nouveau christianisme; dialogue entre un conservateur et un novateur* (1825); *Exposition de la doctrine de Saint-Simon* (1830–32). His complete works have been collected and comprise 19 of the 47 volumes entitled *Œuvres de Saint-Simon et d'Enfantin* (Paris, 1865–78).

Bibliography. N. G. Hubrard, *Saint-Simon, sa vie et ses travaux* (Paris, 1857); Paul Janet, *Saint-Simon et le Saint-Simonisme* (ib., 1878); Georges Weill, *Un précurseur du socialisme: Saint-Simon et son œuvre* (ib., 1894); id., *L'Ecole Saint-Simonienne: son histoire, son influence jusqu'à nos jours* (ib., 1896); Sébastien Charléty, *Histoire du Saint-Simonisme* (ib., 1896).

SAINT SIMON, Etienne Jules Adolphe Desnier de. See Archiac, Vicomte d'.

SAINT-SIMON, Louis de Rouvroy, Duke of (1675–1755). A noted French writer of memoirs. He was carefully trained, entered the army in 1692, resigned his army commission in 1702, and repaired to the court of Louis at Versailles. He had diplomatic aptitude and in 1704 he proposed a method of ending the Spanish War of Succession, which formed, in part, the basis for the Treaty of Utrecht. After Louis XIV's death (1715) Saint-Simon had a seat in the Council of the Regency and was instrumental in the degradation of Madame Montespan's sons, the Duke of Maine and his brother (Aug. 26, 1718), an event to which he devotes 77 pages of his *Mémoires*. He was sent in 1721 on an embassy to Madrid to ask the hand of the Infanta

for Louis XV. In 1723 he left Versailles for his country seat at La Ferté, near Chartres, where he passed his remaining years. Saint-Simon's *Mémoires*, written from memoranda begun about 1699 and developed into notes (1734–38), were given their final form from 1739 to 1752 and impounded for the Foreign Office in 1761. Charles X gave the manuscript to General de Saint-Simon, and an edition appeared in 1830, followed by Chéruel's (30 volumes) in 1856 and by Boislisle's final and full edition (30 volumes), begun in 1879. The preliminary notes for the *Mémoires* were made in an interleaved copy of Dangeau's *Journal* and were printed in 19 volumes in 1854. Other manuscripts of Saint-Simon were locked in the Foreign Office till 1880, when those concerning the Spanish embassy were printed. Eight more volumes appeared in 1890–92, but the *Mémoires* are alone of striking interest. They are, as Saint-Simon calls them, "straightforward, truthful, candid, inspired with honor and integrity," though often misinformed and distorted by prejudice, for Saint-Simon was a vigorous hater, with a certain puritanic sternness that could grow fierce at the persecution of the Huguenots, pitiful over the sufferings of the peasantry, and bitter over the infamies to which in his view Madame de Maintenon (whom he hated intensely) degraded the Church. He saw behind the sham façade of Louis's grandeur "a reign of blood and brigandage," and he discerned no less clearly the masks of individual character, so that his *Mémoires* afford an inimitable portrait gallery. He writes without art, he is confused, ungrammatical sometimes, yet he makes the reader share in the action as no other memoir writer has ever done.

Bibliography. There is an abridged English translation of the *Mémoires* by Bayle St. John, *The Memoirs of the Duke of Saint-Simon in the Reign of Louis XIV and the Regency* (London, 1857; new ed., 4 vols., New York, 1901). Consult also Collins, *The Duke of Saint-Simon*, in "Foreign Classics" (Edinburgh, 1880), and C. A. Sainte-Beuve, *Causeries de lundi*, vols. iii, xv (Paris, 1857–62; Eng. trans. by E. J. Trechmann, New York, 1909–11).

SAINT SOPHIA, sānt sō-fē'ȧ, or **SANTA SOPHIA**, sän'tȧ sō-fē'ȧ. The name commonly given to the great mosque of Aya Sofia at Constantinople, formerly the Christian church of the Divine Wisdom (Hagia Sophia = Ἁγια Σοφία). The Turkish name is a softened version of the Greek; Saint Sophia is a misnomer due to a mistranslation of the original Greek. When Constantine made Byzantium his capital he built a church to the Divine or Holy Wisdom; this was rebuilt by his son Constantius and again in 415 by Theodosius II. In 532 it was totally destroyed in a terrible conflagration resulting from a riot of the Green and Blue circus factions. The Emperor Justinian began at once its reconstruction of fireproof materials on a new plan. Constantinople was then at the zenith of its wealth and power. The whole Roman world was ransacked for the columns, marble, alabaster, and other precious materials required, and under the architects Anthemius of Tralles and Isodorus of Miletus, both in Asia Minor, 10,000 masons were employed, and the structure was dedicated in 538. Twenty years later an earthquake caused the fall of the central dome, but it was promptly rebuilt. So solid was the construction of this vast edifice, the most stupendous of all Byzantium monuments, that it has lasted to the present, in spite of many severe earthquakes.

Both in its plan and section the architects displayed daring originality, combining conceptions derived from the Roman thermæ with wholly new devices in vaulting of Asiatic origin. The church occupies an approximate square 243 feet long, within which the hall of worship forms, not a Greek cross, as is commonly stated, but a vast oblong nave, 243 feet long, 107 feet wide, terminating in a semicircle at each end and flanked by prodigious side aisles in two stories. Over the central part of the nave is a dome, 107 feet in diameter, rising to a height of 180 feet and carried on pendentives (q.v.) borne by four huge arches of nearly 100 feet span. Two of these arches open into the two half domes covering the semicircular ends of the hall; the other two are filled with clerestory windows above the side-aisle roofs. The eastern end of the nave is enlarged by two apsidioles and the apse proper; the western by two apsidioles and the recess containing the three principal entrances. Six other doors give admission to the two broad side aisles. All these nine doors in the west end communicate with a vast two-storied narthex (q.v.) and a one-storied exonarthex entered from the atrium or forecourt. Each side aisle is divided into three sections by two huge hollow transverse buttress masses, which resist the thrust of the two transverse arches under the dome. The whole interior is revetted with precious veined marbles and alabasters up to the vaulting, every inch of which is covered with glass mosaic of the finest Byzantine workmanship. The entire edifice is not only the supreme masterpiece of Byzantine art, but one of the great masterpieces of all time. In no other domed edifice is the eye led up by so masterly an arrangement of vaulting to the summit of the dome, visible from the first moment of entrance; while in the disposition of opposing thrusts and in the ribbed construction of the dome with its 40 buttresses we have the recognition of structural principles and the germs of structural devices which the Gothic builders took up and developed 600 years later.

The Turkish conquest of Constantinople in 1453 led to the conversion of the church of Hagia Sophia into the mosque of Aya Sofia. Four minarets were erected at the corners of the edifice and a fountain of ablution set up in the atrium. The whole interior was heavily whitewashed to obliterate every Christian emblem in the mosaic and the crosses chiseled from the bronze doors. Later, tombs and other buildings were added, the mosaic floor covered with mattings, and the interior disfigured by great disks bearing Arabic inscriptions. In 1848 Fossati, an Italian architect employed by Sultan Abdul Medjid to repair the mosque, scraped off the whitewash, disclosing the superb mosaics, but was obliged to conceal again all figures of human beings and all Christian emblems with painted canvas or gold leaf.

The architecture of the great mosques of Constantinople and some other Turkish cities is based fundamentally on that of Aya Sofia. It is remarkable that never was this type copied in later Byzantine architecture nor elsewhere until the Turks adopted it and adapted it to their uses. See ARCHITECTURE; BYZANTINE ART; DOME; MOHAMMEDAN ART; MOSQUE.

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Pulgher, *Les anciennes églises byzantines de Constantinople* (Vienna, 1878–80); Rudolf Adamy, *Architektonik der altchristlichen Zeit* (Hanover, 1884); Lethaby and Swainson, *The Church of Sancta Sophia* (London, 1894); also Edward Gibbon, in *Decline and Fall of the Roman Empire*, edited by J. B. Bury, vol. ii (ib., 1912).

SAINT STANISLAS, stăn'ĭs-lȧs, ORDER OF. A Russian order of merit, of Polish origin, having been founded by King Stanislas II in 1765. After the partition of Poland it lapsed, but was restored in 1815 by the Czar Alexander as King of Poland. The decoration is an eight-pointed red enameled cross with gold eagles between the arms. The white medallion is surrounded by laurel and bears the initials S. S. (*Sanctus Stanislas*).

SAINT STEPHEN, stē'vėn. A town and port of entry in Charlotte County, New Brunswick, Canada, at the head of tidewater on St. Croix River and on the Canadian Pacific and New Brunswick Southern railways (Map: New Brunswick, C 6). Pop., 1901, 2840; 1911, 2836.

SAINT STEPHEN, ORDER OF. A royal Hungarian civil order with three classes, founded in 1764 by Maria Theresa. The King of Hungary is the grand master, and only nobles are eligible for membership. The decoration, a green enameled cross with the crown of St. Stephen, has a red medallion on which is a green mound crowned by a silver apostolic cross between the letters M T, the whole surrounded by the inscription, *Publicum Meritorum Præmium*. See Plate of ORDERS.

SAINT STEPHEN'S STONE. See HELIOTROPE.

SAINT THOMAS, tŏm'ȧs. An island in the Gulf of Guinea. See SÃO THOMÉ.

SAINT THOMAS. One of the Danish West Indian islands (see WEST INDIES, DANISH), situated 36 miles east of Porto Rico (Map: West Indies, F 3). It is about 13 miles long from east to west and covers an area of 33 square miles. It is hilly, reaching, in West Mountain, an altitude of 1555 feet. The climate is hot but steady, and the mean annual temperature is 78° F. The economic importance of the island disappeared with the abolition of slavery (1848), which was essential to the sugar industry. At present the island produces chiefly rum and is important as a coaling station. Pop., 1901, 11,012; 1911, 10,678. Charlotte Amalie (q.v.) is the chief town and capital of the islands. The inhabitants are mostly descendants of negro slaves. English is the predominant language. The island was discovered by Columbus in 1493, passed to the Danish West India and Guinea Company in 1671, and was taken over by the crown in 1754.

SAINT THOMAS. A city and the capital of Elgin County, Ontario, Canada, on the Canadian Pacific, Grand Trunk, Pere Marquette, Michigan Central, and Wabash railways, 14 miles south by east of London (Map: Ontario, D 8). Its noteworthy buildings include the courthouse, hospital, old people's home, and collegiate institute. The value of the manufactured output in 1910 was $3,573,820. Pop., 1901, 11,485; 1911, 14,054.

SAINT THOMAS, CHRISTIANS OF. A name given to Christians in India who are said to have been converted by the Apostle St. Thomas. A certain Theophilus, an Arian, delegated in 354 by the Emperor Constantius to visit Arabia Felix and Abyssinia, refers to those Christians. Their liturgy was in the Syrian language. The first tomb of the Apostle was there—a proof of his martyrdom and missionary work in India. In the British Museum collections are documents which witness to the above as late as 1604. The Christians of Malabar scattered and some returned to paganism. Those on the Cochin side, practically free from persecution and unmolested by their rulers, remained firm. They were visited in 1542 by St. Francis Xavier, who in his report to his general remarks that they paid signal honors to, and claimed to be descendants in Christianity of, St. Thomas. They were visited by historians and other unorthodox teachers. In spite of their long isolation numerous tokens, stone crosses, legends, inscriptions, decorations, and the like seem to witness to their having been evangelized by St. Thomas. Very little is known of the successors of St. Thomas. One was present at the Council of Nice in 325. He signs himself John the Persian, over the Churches in all Persia and Bishop of Great India. Probably his only work was controlling the work of missionaries he sent there. Popes exercised their solicitude frequently and helpfully. Ecclesiastical statistics record that in 1911 there were three vicariates and a Catholic population of 320,212, with 31,886 children being educated. Consult: Assemani, *Bibliotheca Orientalis* (Rome, 1719–28); E. A. T. Wallis Budge, *The Book of Governors: The Historica Monastica of Thomas, Bishop of Marga, A.D. 840, forming a History of Nestorian Monasticism . . .* (2 vols., London, 1893); Medlycott, *India and the Apostle St. Thomas* (London, 1905).

SAINT THOMAS AQUINAS. See AQUINAS, THOMAS.

SAINT-THOMAS-THÉ-APOSTLE. A suburb of Exeter, England. See EXETER.

SAINT TROPÈZ, PIERRE ANDRÉ DE SUFFREN. See SUFFREN DE SAINT-TROPÈZ, P. A. DE.

SAINT-VÉRAN, MARQUIS DE MONTCALM DE. See MONTCALM DE SAINT-VÉRAN, L. J., MARQUIS DE.

SAINT VICTOR, ADAM OF. See ADAM OF SAINT VICTOR.

SAINT VICTOR, CLAUDE MARIE FRANÇOIS NIEPCE DE. See NIEPCE DE SAINT VICTOR, C. M. F.

SAINT-VICTOR, HUGO OF. See HUGO OF SAINT-VICTOR.

SAINT-VICTOR, săn'-vĕk'tôr', PAUL DE (1827–81). A French critic. He replaced Théophile Gautier in 1855 as dramatic and art critic on the *Presse*. He wrote for Girardin's *Liberté* (1866–69) and the *Moniteur Universel* (1869–81). His most picturesque effort is *Barbares et bandits* (1871), and his other works include *Hommes et dieux* (1866), his masterpiece; *Les femmes de Goethe* (1869); *Victor Hugo* (1885); *Le théâtre contemporain* (1889); *Les dieux et les demi-dieux de la peinture* (1863), with Gautier and Houssaye. Consult A. Delzant, *Paul de Saint-Victor* (Paris, 1887).

SAINT VIN'CENT. An island of the British West Indies, belonging to the colony of the Windward Islands and situated about 21 miles south of St. Lucia (Map: West Indies, G 4). It is oval in shape, with an area of about 140 square miles. It is of volcanic origin and traversed from north to south by a ridge or mountain range which rises near the northern end in an active volcano, the Soufrière, to a height of about

4000 feet. The climate is healthful and equable, the temperature ranging between 90° and 65°. The rainfall is abundant, the mountains are covered with forests, and there are many fertile valleys. The chief products are arrowroot, cacao, cotton, sugar, rum, fruits, and spices. Pop., 1891, 41,054; 1901, 47,548; 1911, 41,877, chiefly negroes. Capital, Kingstown (q.v.). St. Vincent was discovered Jan. 22, 1498, by Columbus. In 1797 most of the native Caribs were transferred to Ruatan in the Gulf of Honduras. In 1898 the island was swept by an unusually violent hurricane and in May, 1902, large parts of it were devastated by the eruption of the Soufrière (q.v.), occurring simultaneously with that of Mont Pelée (q.v.) in Martinique. About one-third of the island was laid waste. Several villages were destroyed and about 1500 persons were killed.

SAINT VINCENT, Cape. See Cape Saint Vincent.

SAINT VINCENT, John Jervis, Earl of. A British admiral. See Jervis, John.

SAINT VINCENT DE PAUL, sān văn'sān' de pōl, Society of. A society of Catholic laymen founded in Paris in 1835 by Frédéric Ozanam (q.v.), with the object of visiting the poor and suffering and dispensing relief, promoting the elementary and religious instruction of poor children, distributing moral and religious books, and undertaking any other charitable work to which its resources are adequate. It is unsectarian in its methods. The headquarters are in Paris, where the affairs of the society are administered by a president general and a council general. There are other subdivisions of the society, such as the superior council, the central council, and the particular council, each having its sphere of authority strictly defined. The superior council has jurisdiction over countries or sections thereof into which the society has been introduced; the particular council is subject to the superior council, and generally has supervision over the affairs of a diocese, while the conference has charge of parish work.

SAINT VI'TUS'S DANCE. See Chorea.

SAINT VLAD'IMIR, *Russ. pron.* vlâ-dyĕ'mĕr, Order of. A Russian civil order of merit with four classes, founded by Catharine II in 1782. The decoration is a red crôss with the initial of the saint.

SAINT VLAD'IMIR, University of. See Kiev.

SAIONJI, sī'ôn-jĕ, Kinmochi, Marquis (1849–). A Japanese statesman, born in Kyoto, of an old family of court nobles, and educated at the University of Paris. An intimate friend of the Mikado, he entered the diplomatic service in 1880 and became Envoy at Vienna in 1885 and at Berlin in 1887. In 1892–96 he was Minister of Education and acting Foreign Minister, in 1898 again Minister of Education, in 1906 Premier, and in 1911–12 Premier again. In 1903 he had succeeded Prince Ito as head of the Seiyu-kai, or Friends of the Constitution. Consult an article by J. Takegoshi in *Contemporary Review*, vol. lxxxix (London, 1906).

SA'IS (Lat., from Gk. Σάις, Coptic *Sai*). A city of ancient Egypt, on the right bank of the Canopic branch of the Nile, in lat. 30° 57′ N., near the site of the modern village of Sa el Hager. It was the capital of the Saitic nome and is mentioned in very early times as the seat of worship of the goddess Neith (q.v.), whom the Greeks identified with Athene. A great festival was also held here in honor of Osiris. Under the twenty-sixth dynasty founded by Psammetichus I (q.v.), the city became the capital of Egypt and was adorned with many splendid buildings. Herodotus speaks with special admiration of a shrine or chapel, hewn from a single block of granite, which Aahmes II caused to be made near Elephantine and transported to Sais. In the remarkable revival of art, letters, and ancient religious customs which took place under the twenty-sixth dynasty, Sais became famous as a centre of culture and as the seat of an important theological school. The *Book of the Dead* (q.v.) seems to have been the subject of special study, and in the Saitic revision of this interesting collection the chapters composing it were for the first time arranged in a fixed order. Under the Ptolemies the city declined in importance, though it was probably an episcopal see in early Christian times. The buildings of the Saitic Pharaohs are now marked by heaps of rubbish, and Mariette's excavations upon the site were unproductive. Consult: K. A. Wiedemann, *Aegyptische Geschichte* (Gotha, 1884–88); Sir J. G. Wilkinson, *Manners and Customs of the Ancient Egyptians* (new ed., 3 vols., New York, 1893); J. H. Breasted, *A History of the Ancient Egyptians* (New York, 1908).

SAISSET, sā'sĕ', Emile Edmond (1814–63). A French philosopher, born at Montpellier and educated at the Ecole Normale. He became professor of philosophy at Caen in 1836, at the Ecole Normale in 1842, at the Collège de France in 1853, and at the Sorbonne in 1863. His publications include: his doctor's thesis, *Ænésidème* (1840); a translation of Spinoza (2 vols., 1843); *Essai sur la philosophie et la religion au XIXe siècle* (1845); *Renaissance du voltairianisme* (1845); *Discours de la philosophie de Leibnitz* (1857), a work which had much influence; *Mélanges d'histoire, de morale, et de critique* (1859); *Essai de philosophie religieuse* (1860); *Précurseurs et disciples de Descartes* (1862); *Critique et histoire de la philosophie* (1865); *Le scepticisme: Ænésidème, Pascal, Kant* (1865).

SAIVAS, sī'vāz. Worshipers of the Hindu deity Siva (q.v.), also called Sivaites. They are divided into many sects, most of which represent decadent schools of philosophy. Most of the Yogins, or ascetic philosophers, were and are Saivas, and the ascetics called Urdhvabāhus and Akāśamukhas (i.e., those who held up the arms and the face respectively till they became stiff) are usually of this class. On the other hand, many of the so-called Saivas, such as the Jāngamas (wanderers) and Daṇḍins (staff bearers), are not necessarily such. In the earliest period there are noticeable two marked tendencies in the Saiva cult, its democratic disregard of caste and its psychic philosophy. The Saiva sects have been drawn for the most part from the two extremes of India's social life. The lowest and most unintelligent mendicants, understanding only asceticism, generally belong to this, as do, for the reason just stated, the philosophers; while the rich middle classes, especially those of north India, are followers of Vishnu (q.v.). The Paramahansa, highest soul Saivas, are the most spiritual, though the modern representatives are often conspicuous merely for nudity and stolidity.

One of the oldest of the Saiva sects is that of the Aghoris, cannibals devoted to the most disgusting practices, but known as Saivas for 15 centuries. Many of the Saivas are Saktas (q.v.). Consult: Wilson, *Sketch of the Religious Sects of the Hindus* (Calcutta, 1846); E. W. Hopkins, *Religions of India* (ib., 1895); L. D. Barnett, *Antiquities of India* (London, 1913).

SAJOU, sȧ-jo͞o′ *or* sȧ′zho͞o′. See SAPAJOU.

SAJOUS, sȧ′zho͞o′, CHARLES EUCHARISTE DE' MEDICI (1852–). An American physician, born at sea, off the coast of France. He came to America in 1861. At Jefferson Medical College, Philadelphia, from which he graduated in 1878, he was from 1881 to 1890 clinical lecturer on laryngology. In the same city he served as professor of laryngology and dean of the Medico-Chirurgical College (1897–98) and as professor of therapeutics at Temple University (after 1909). His more important work, beginning in 1888, was as editor in chief of the *Annual of the Universal Medical Sciences* (45 volumes), which in 1896 became the *Annual and Analytical Cyclopædia of Practical Medicine* (7th ed., 1915). He wrote *Lectures on the Diseases of the Nose and Throat* (1885; 2d ed., 1890) and *Hay Fever* (1885) and invented several valuable operating instruments. From 1903 he paid special attention to internal secretions—*The Internal Secretions and the Principles of Medicine* (1903–07; 7th ed., 1915)—thereby introducing a new branch of medicine, hemadenology. On this subject he contributed important essays to the *New York Medical Journal* (1914, 1915), of which journal he had become the editor in 1909.

ŚAKA, shä′kȧ. An important system of reckoning time in India, used over practically the entire country and the one exclusively employed in astronomical works. According to a tradition it was invented by King Salivāhana, also called Saka, in 78 A.D., and the era is consequently sometimes called by his name, but it may have been founded by Nahapāna. It begins, like the Samvat (q.v.) year, on the full moon of the month Chaitra, which corresponds to March–April, is lunisolar in character, and is generally reckoned in expired years, so that the Saka date given represents the year last completed. Christian dates are reduced to Saka by the subtraction of 78 from the Christian year. Consult Sewell and Dikshit, *The Indian Calendar* (London, 1896), and Sewell, *Indian Chronography: An Extension of the Indian Calendar with Working Examples* (ib., 1912). See SAMVAT; SAPTARSHI.

SAKAI, sä′kī. One of the aboriginal peoples of the Malay Peninsula, also called Senoi. The purest representatives of the stock are found in the interior of the peninsula, particularly in southeastern Perak and northwestern Pahang. Physically the Sakai are undersized (about 150 centimeters on the average), with dolichocephalic skulls, dark-brown skins, curly or wavy hair, and rather thick lips. They are still nomads, except at a few points of the west coast, where regular relations with the Malays have led to small plantations of rice and sugar cane. Elsewhere they are found in small family groups (mostly two or three families), with patriarchate rule, but copartnership of man and wife on a monogamic basis. Their houses are very primitive in character, and in the regions where tigers abound platforms are built in the trees. The language may be described as monosyllabic with a strong agglutinative tendency, and is divided into several dialects, of which two only are known to any extent. It contains a number of Malay loan words. Consult: Stevens, *Materialien zur Kenntnis der wilden Stämme auf der Halbinsel Malakka* (Berlin, 1892); Schmidt, *Die Sprachen der Sakei und Semang auf Malacca und ihr Verhältnis zu den Mon-Khmer Sprachen* (The Hague, 1901); R. Martin, *Die Inlandstämme der malayischen Halbinsel* (Jena, 1905); Skeat and Blogden, *Pagan Races of the Malay Peninsula* (2 vols., London, 1906); O. D. Tauern, "Versuch einer Sakai-Grammatik und Vokabularium," in *Anthropos* (Salzburg, 1914).

SAKAI, sä′kī′. An important manufacturing city in the Prefecture of Osaka, Japan, situated on Osaka Bay, 6 miles southwest of Osaka (Map: Japan, D 6). Its chief manufactures include cotton goods, cotton rugs, sake, bricks, cutlery, and cosmetic powders. Pop., 1908, 61,103.

SAKALAVA, sä′kȧ-lä′vȧ. A negroid people living in a number of tribes in the western part of Madagascar. Physically they closely resemble the Bantu negroes of Africa, but exhibit many results of crossing with the Malay inhabitants of the rest of the island. Their culture also is similar to that of their African neighbors. The weight of authority is in favor of an African origin of the Sakalava, though some competent investigators regard them as Melanesian immigrants. See MADAGASCAR. Consult A. Dandouau, "Coutumes Sakalava," in *Anthropos* (Salzburg, 1914).

SAKANDERABAD, sȧ-kän′dĕr-ȧ-bäd′. A town of Hyderabad, India. See SECUNDERABAD.

SAKATA, sȧ-kä′tȧ. A seaport in the Prefecture of Yamagata, Japan, situated on the west coast of Hondo, about 100 miles south of Akita. It has an extensive trade in rice. Pop., 1908, 23,513.

SAKČINSKI, IVAN KUKULJEVIČ-. See KUKULJEVIČ-SAKČINSKI, IVAN.

SAKE, sä′kȧ. The rice wine of the Japanese. It contains only a small percentage of alcohol, but in some of its forms is very intoxicating through the presence of fusel oil. There are many varieties, differing in strength, color, and flavor. The best comes from the Province of Settsu. Sake is used freely as a beverage and in the ceremonies connected with Confucianism and Shinto. At elaborate feasts it is customary for the host to drink a cup of sake with each of his guests. See RICE.

SAKHALIN, sä′kȧ-lyēn′, or **SAGHALIEN,** sä′gȧ-lyēn′. An island off the east coast of Siberia, 600 miles long and from 16 to 100 miles wide, extending from lat. 45° 54′ to 54° 30′ N. and from long. 141° 30′ to 145° E. (Map: Asia, Q 3). It is separated from the Maritime Province on the west by the Gulf and Strait of Tartary, the latter only about 5 miles wide, and from the island of Yezo on the south by the Strait of La Pérouse, about 27 miles at its narrowest part. The island covers an area of 27,823 square miles, of which 14,668 belong to Russia and the remaining, south of the 50th parallel of latitude, to Japan under the name Karafuto. A mountainous ridge 1500 to 3000 feet runs along the island for the whole of its length, flanked by low, wooded, sandstone hills to the east and west. Many fishing villages are established along the coast, especially

in the south about Aniva Bay and in the east about the Gulf of Patience. Three-fourths of the island is covered with dense pine forests.

The rivers of Sakhalin have the character of mountain streams and are of little value as waterways. The chief rivers are the Tym, flowing in a northern direction and falling into the Sea of Okhotsk after a course of about 150 miles, and the Paranay (Poronai), which falls into the Gulf of Patience on the east coast. Very little is known of the geology of the island, but extensive deposits of an inferior grade of coal have been discovered, and some mines are worked near Dui, on the west coast, and in other places. Coal and petroleum exist in large quantities. The northern part, which lies close to the mainland, has a continental climate during the winter, when the narrow strait freezes over; and the eastern coast, subject to the cold currents of the Sea of Okhotsk, has a more severe climate than the western coast, which is affected principally by the Sea of Japan. In the central part the winters are very severe, with heavy snowfalls.

Almost the entire surface is covered with forests, chiefly coniferous. The rivers are well stocked with fish and provide the natives with their staple food. According to Japanese reports the agricultural products, principally potatoes, turnips, and beans, do not vary much from those grown in Hokkaido, and the prospects for agriculture and pasturing are said to be fair, although the sea fisheries and the timber are bound to remain the principal sources of livelihood. The Japanese estimated the value of the timber in their territory at $45,000,000, yielding $300,000 per annum. Japanese immigrants began to pour into the island immediately after its military occupation, each settler being allotted about 19 acres of land. The Russians, who were principally convicts, released convicts, or exiles, engaged chiefly in coal mining and lumbering. The estimated population at the beginning of 1913 was 56,438, of whom 14,300 were in Russian and 42,138 in Japanese Sakhalin. Formerly, when Sakhalin was used as a penal colony, the Russian population was larger. Since the Japanese occupation the number of Japanese in Karafuto has steadily increased; it was 24,138 at the beginning of 1909 and 39,846 at the beginning of 1913. At the later date the native population in Karafuto numbered 2150. The natives are principally Gilyaks in Russian Sakhalin and Ainos in Karafuto. The principal settlements in the Japanese territory are Korsakov, which had been the seat of the Russian administration and was burnt down by the Russians when they evacuated it, and Vladimirovka, renamed by the Japanese Harukimachi, the seat of the Japanese administration. In December, 1906, a railway, 30 miles long, between these two places was completed. The principal settlements in the Russian territory are Alexandrovsk and Dui.

The existence of Sakhalin was first brought to the attention of Europe by the Dutch navigator Gerritz de Vries about the middle of the seventeenth century. The southern part belonged to Japan until 1875, when it was acquired by Russia in exchange for some of the southern Kurile islands. In 1905 it was conquered by the Japanese, and in the Treaty of Portsmouth the portion south of the fiftieth parallel, with an area of 13,155 square miles, was ceded to them. Consult: F. Schmidt, *Reisen im Amurlande und auf der Insel Sachalin* (St. Petersburg, 1868); Poljakow, *Reise nach der Insel Sachalin, 1881–82* (Ger. trans., Berlin, 1884); C. H. Hawes, *In the Uttermost East* (London, 1903). See Russo-Japanese War.

SAKI, sä'kĭ (South American name). A monkey of the south American genus *Pithecia*, allied to the howlers, but characterized by the inclination forward of the lower incisor teeth, much as in lemurs. They have a thumb and the tail is not prehensile. Associated with them in these characteristics are the ouakari monkeys, which, however, differ greatly in their very short tails and otherwise. Most of them have long, soft hair, which has a wiglike appearance on the head, forms a long, divided beard beneath the chin, and makes the long tail bushy. Five or six species are known, all small, retiring, sober in their behavior, and confined to the valleys of the Amazon and Orinoco. One is the Brazilian couxio (*Pithecia satanis*), which is everywhere blackish brown; another is the couxia, or red-backed saki (*Pithecia chiropotes*), marked by a large dorsal patch of reddish brown. The best-known one, perhaps, is the blackish, hairy, or Humboldt's saki, or parauaçu. It is speckled gray and has a heavy hood of hair overhanging the face. Consult H. W. Bates, *A Naturalist on the River Amazons* (new ed., London, 1910). See Monkey; and Plate of American Monkeys.

SAKKARA, sȧk-kä'rä. A village of Egypt, noted for its ancient mausolea and pyramids. See Saqqara.

SAKTAS, säk'tȧz (Skt. *śākta*, worshiper of the female principle of divine energy, from *śakti*, power). In Hindu religion, the worshipers of any of the female representations of divine power. In its usual sense the word is applied to the worshiper of the female energy or wife of Siva (q.v.) alone; and the Saktas properly so called are, therefore, the votaries of Durga, or Uma. Originally, however, the mother goddess worshiped by the Saktas has nothing to do with Siva. She was herself, as Durga, Parvati, Kali, or simply as Great Mother, the matriarchal deity of the Dravidians, but subsequently by the Aryans she was regarded as the female principle of an androgynous god. The works from which the tenets of this religion are derived are known as *Tantras* (q.v.), but since in some of these works the ritual enjoined did not comprehend all the impure practices recommended in others, the sect became divided into two branches, the Dakṣiṇācārins and the Vāmācārins, the followers of the right-hand and the left-hand ritual respectively.

The Dakṣiṇācārins profess to possess a ritual as pure as that of the Vedas. Their priests, however, are not required to know any Veda. The Vāmācārins, on the other hand, adopt a ritual of the grossest impurities. They profess the desire to become one with the deity by means of mystic rites; but in reality these rites are simply orgies of lust. This worship is a survival of the same primitive mother worship that once obtained among the Dravidians as among the Semites. As most Saktas are Saivas, see Siva and Saivas, with the literature cited under the latter title.

SAKUNTALA, sȧ-kụn'tȧ-lȧ. A Hindu nymph. Her name occurs in the *Yajurvēda* (see Veda) and the *Satapatha Brāhmaṇa;* she is the subject of an episode of the Mahabharata

(q.v.), and is mentioned in the *Puranas* (q.v.). She is best known, however, as the heroine of Kalidasa's *Abhijñānaśakuntalā*, or Sakuntala Recognized. The principal features of the legend of Sakuntala, as narrated in the Mahabharata, are the following: she was the daughter of the saint Viśvamitra and the water nymph Menaka. Abandoned by her parents, she was adopted by the hermit Kanva, who brought her up as his daughter. While King Dushyanta was hunting in the forest he came by chance to the hut of Kanva, saw Sakuntala, and fell in love with her. He married her and promised her that the son she would bear him should be the heir to his throne. After the birth of her child she remained at the hermitage until the boy was six years old; but Dushyanta, unmindful of his promise, did not send for her. Sent by Kanva to the residence of Dushyanta, she was repudiated by him until a voice from heaven assured him that Sakuntala had spoken the truth and that he saw before him his lawful son. Thereupon he recognized her as his queen and her son as his heir, whom he named Bharata and who became the founder of the race of the Bharatas. In the drama Kalidasa modified the legend so as to show that the obstacle to her recognition was the consequence of a curse which Sakuntala had incurred from a wrathful sage, who had considered himself treated uncourteously by her on one occasion when he had visited Kanva's hermitage. Consult: Pischel, *De Kâledâsæ Çakuntali Recensionibus* (Breslau, 1870); Montgomery Schuyler, Jr., "Editions and Translations of Çakuntalā," in *American Oriental Society Journal*, vol. xxii (Boston, 1901); Eugen Zabel, "Sakuntala von Kālidāsa," in *Zur modernen Dramaturgie* (Oldenburg, 1903); V. Henry, *Les littératures de l'Inde* (Paris, 1904); A. A. Macdonell, *History of Sanskrit Literature* (London, 1913). See KALIDASA.

SAL (*Shorea robusta*). An East Indian tree of the family Dipterocarpaceæ, highly valued for its timber, which resembles teak in properties and uses. The great forests of the southern Himalaya, which in some places have been cut down, have passed under the care of the government for preservation. Several related species native to India and the Philippine Islands are important timber trees.

SALA, sä'lä. A town of Sweden, situated on the Northern Railroad, 55 miles northwest of Stockholm (Map: Sweden, F 7). It is important on account of its silver mine, which has yielded a large output since the sixteenth century and still produces yearly over 30,000 ounces of silver. Pop., 1900, 6593; 1910, 7693.

SALA, sā'lä, GEORGE AUGUSTUS HENRY (1828–95). An English journalist, born in London. After studying drawing and working as scene painter and book illustrator, he became in 1848 editor of *Chat*, and later wrote for *Household Words* and other English periodicals. He came to America in 1863 as special war correspondent for the *Daily Telegraph* of London, and in 1864 published *America in the Midst of the War*. He acted as correspondent to the same paper at the Paris Exposition (1867), during the Franco-German War (1870–71), in Spain, Paris, and Venice (1866–67), in Russia (1876), and in Australia (1885). He twice visited the United States as lecturer (1879, 1885). Sala's pretentious style is finely ridiculed by Matthew Arnold in *Friendship's Garland*. Among Sala's popular books of travel, made up mostly from his contributions to the *Daily Telegraph*, are *A Journey Due North* (1858); *A Trip to Barbary and Hogarth* (1866); *From Waterloo to the Peninsula* (1867); *Rome and Venice* (1869); *America Revisited* (1882); *A Journey Due South* (1885); *Things I Have Seen* (1894); and the most interesting *Life and Adventures* (1895). His social satire is best represented by *Twice Round the Clock* (1859). He also wrote several popular novels, and his gastronomic enthusiasm inspired the composition of his last work, *The Thorough Good Cook* (1895).

SALAAM, sä-läm' (Ar. *salām*, peace, from *salima*, to be safe). The common salutation among Mohammedans to those of their own faith; to non-Mohammedans a different form is used. The full salutation is *as-salām 'alaikum*, peace be unto you, and the proper reply is *wa-'alaikum as-salām*, and unto you peace. The giving of the śalaam is a duty recommended by Mohammed; the reply is obligatory. Consult E. W. Lane, *Manners and Customs of the Modern Egyptians* (3d ed., New York, 1908).

SAL'ADIN (SALAH ED DIN YUSUF IBN EYUB), "Honoring the Faith" (1138–93). Sultan of Egypt and Syria, born at Tekrit of Kurdish blood. After a life of pleasure and study he accompanied his uncle, Shirkuh, about 1164, on an expedition dispatched by Nureddin, Sultan of Syria, ostensibly to reinstate Shawir, the expelled Vizier of Egypt. When the latter, some years later, threw off his allegiance to Nureddin, Shirkuh made a second invasion of Egypt, overthrew Shawir, assumed the vizierate, and, dying soon after, was succeeded by Saladin (1169). The last of the Fatimite caliphs died in 1171 and Saladin became absolute ruler of the country, though he did not proclaim himself Sultan till after the death of Nureddin in 1174. Between 1174 and 1183 Saladin wrested Syria and most of Mesopotamia from the successors of Nureddin. During these conquests he also warred against the Christians, but without success. In 1187 he made a great onslaught upon the Kingdom of Jerusalem, and a desperate battle was fought at Hittin, which ended in the total defeat of the Christians. Guy de Lusignan, King of Jerusalem, the grand master of the Templars and Hospitalers, and an immense number of prisoners fell into Saladin's hands. The capture of Tiberias, Acre, Jaffa, and Beirut, with many other places, was followed by the surrender of Jerusalem in October. Tyre alone held out against Saladin until relieved by Conrad of Montferrat. The armies of the Third Crusade, under Richard the Lionhearted and Philip II of France, retook Acre after a memorable siege of two years (1191), but, owing to the dissensions between Richard and Philip, the great object of the Crusade, the recovery of Jerusalem, was left unaccomplished. Richard entered into a three years' armistice with Saladin by which the coast from Jaffa to Tyre was left to the Christians (1192). Saladin died at Damascus, March 4, 1193. In Saladin the warrior instinct of the Kurd was united to a high intelligence; and even his opponents did not deny him the noblest qualities of chivalry, courage, fidelity to treaties, greatness of soul, piety, justice, and moderation. He was not a mere soldier, but also a wise administrator. Consult: Gaston-Paris, *La légende de Saladin* (Paris, 1893); Stanley Lane-Poole, *Saladin and the Fall of Jerusalem* (New York,

1898), the best work on the subject; Yusuf ibn Rafi, *The Life of Saladin*, translated for the Palestine Pilgrims' Text Society (London, 1899). See CRUSADE.

SALADO, sä-lä'dō, Río. A river of north Argentina. It rises among the Andean ranges in the northwestern part of the country and flows southeast through the Gran Chaco till it joins the Paraná River opposite the city of Paraná, after a course of about 1000 miles (Map: Argentina, G 3). It is a shallow, unnavigable, and very sluggish stream, meandering over the plain and frequently dividing into a network of channels and backwaters, which during floods are merged into large shallow lagoons. At low water it evaporates so rapidly as to become brackish in its lower course, whence its name, which means salt river.

SALADO, Río. A river of west Argentina. It rises on the slope of the Andes in the Province of Catamarca and flows southward in a rambling course over the plains, parallel with the mountains, from which it receives a number of tributaries. It is about 1000 miles long and was formerly the most important member of the Colorado River system. Now, however, it never reaches the Colorado, but is lost by evaporation in the extensive salt marshes 80 miles north of that river. There are evidences that the process of desiccation of the surrounding plains is still going on.

SALAD PLANTS. Vegetables whose green parts are used for human food. The plants so employed may be divided into three groups: piquant or warm salads, such as cress, nasturtium, water cress, and mustard; bitter, of which dandelion, chicory, and endive are typical; and neutral, to which belong such characterless plants as corn salad. Lettuce really belongs to the second group, but when properly grown the bitter flavor is so greatly modified that it approaches the neutral group. The other bitter salads mentioned are similarly improved in flavor. Celery, which also belongs to the bitter group, and lettuce are unquestionably the leading salads in America, thousands of acres being annually devoted to their cultivation. Cardoon, which is grown in much the same way as celery, is rarely cultivated in the United States, but is popular in Europe. It grows somewhat larger than most varieties of celery.

CARDOON (*Cynara cardunculus*).

In general salads require a very rich, light, well drained, fibrous, loamy soil well exposed to the sun. To be in best condition they must be quickly grown, gathered when in prime vegetative vigor, before any indications of going to seed are manifested, and placed upon the table in the shortest possible time after gathering, before they have lost any of their crispness. See articles upon the various vegetables mentioned above.

SAL'AL. A shrub. See GAULTHERIA.

SAL'AMAN, MALCOLM CHARLES (1855–). An English author and journalist, born in London and educated at University College School in that city and at Owens College, Manchester. Although he had studied mechanical engineering for four years, he became a journalist, and edited two weekly papers. His critical writing was devoted chiefly to prints and to plays. From 1883 to 1894 he was dramatic and art critic for the *Sunday Times*, and from 1890 to 1899 was on the staff of the *Graphic*. Among his numerous writings are: *Ivan's Love Quest and Other Poems* (1879); *Woman through a Man's Eyeglass* (1892); *The Old Engravers of England* (1906); *Old English Color Prints* (1909); *Old English Mezzotints* (1910); *Modern Etchings (British)* (1912); *French Colour-Prints of the Eighteenth Century* (1913). Salaman edited the plays of Sir A. W. Pinero (1891–1900) and himself wrote several plays.

SALAMANCA, sä'lä-mäng'kä. The capital of the Province of Salamanca, in the old Kingdom of León, and one of the oldest and most famous university towns of Spain, situated on the Tormes River, 105 miles northwest of Madrid (Map: Spain, C 2). It is built on three hills surrounded by a dreary, treeless plain with a climate severe in winter and very hot in summer. It is surrounded by a wall, parts of which are very old; and a Roman bridge of 27 arches, more than half of which belong to the original structure, crosses the Tormes. The town still has a mediæval aspect, with narrow, crooked streets lined with stately and venerable structures. In the centre of the town is the large Plaza Mayor, the finest of its kind in Spain; it is surrounded by colonnades and by lofty buildings. Though a large part of the town was destroyed during the French occupation in 1812, there are still in existence 25 churches, some of which date from the eleventh and twelfth centuries, such as the old cathedral, a massive structure begun in 1100. Immediately adjoining it stands the new cathedral, begun in 1509 and finished in 1733. It is essentially late Gothic and has an imposing interior. Opposite the cathedrals stands the university building (see SALAMANCA, UNIVERSITY OF), begun in 1415, with an elaborately decorated plateresque façade. Of the 25 colleges and numerous old convents the greater number are in various states of ruin, many having been entirely destroyed by the French. Among other interesting buildings are the Casa de le Salina, now occupied by the Provincial Assembly, and the church of San Estéban, both dating from the sixteenth century and both having elaborate plateresque façades; and the sixteenth-century Casa de la Conchas, whose façade is ornamented with shells. There is also the fifteenth-century Torre del Clavero. Industrially and commercially Salamanca is unimportant. Pop., 1900, 25,019; 1910, 26,295.

Salamanca was known in ancient times as Elmantica or Salamantica. About 220 B.C. it was captured by Hannibal, who, according to the tradition, spared the city on account of the heroism of its women. It was taken and retaken several times by the Arabs. Consult A. F. Calvert, *Leon, Burgos, and Salamanca* (New York, 1908).

SALAMANCA. A town of the State of Guanajuato, Mexico, situated on the right bank of the Lerma River, 28 miles south of the city of Guanajuato (Map: Mexico, H 7), and on the Mexican Central Railroad. It is an important glove and cotton manufacturing centre and contains an establishment for the manufacture of porcelain. The first settlement in the

SALAD PLANTS

1. CORN SALAD (Valerianella olitoria).
2. CHICORY (Cichorium Intybus).
3. DANDELION (Taraxacum officinale).
4. WATER CRESS (Nasturtium officinale).
5. ENDIVE (Cichorium Endivia).
6. LETTUCE (Lactuca sativa).
7. CELERY (Apium graveolens).

town was made by the Augustinian fathers in 1616. Pop., 1900, 13,583; 1910, 13,497.

SAL'AMAN'CA. A village in Cattaraugus Co., N. Y., 63 miles south of Buffalo, on the Allegheny River and on the Pennsylvania, the Erie, the Buffalo, Rochester, and Pittsburgh, and the Western New York and Pennsylvania (traction) railroads (Map: New York, B 6). It has a large trade in lumber and important railroad interests. There are railroad repair shops and yards and various manufactures, including furniture, leather, and lumber products. Pop., 1900, 4251; 1910, 5792.

SALAMANCA, sä'lä-män'kä, UNIVERSITY OF. A Spanish university, one of the most renowned of Europe from the fifteenth to the seventeenth century. Founded by Alfonso IX of León (c.1230) and refounded by St. Ferdinand of Castile in 1242, it came into prominence in the reign of Alfonso X (q.v.) (1252–82), surnamed the Astronomer. Its chief distinction was in the field of the canon and civil law and its special functions were the introduction of Arabic learning into Europe and the democratic preservation of the liberties of the Middle Ages. Owing to financial difficulties it led a somewhat checkered existence, but was in alliance with and favored by the papacy and in some measure supported by it. Its rise to distinction began in the fifteenth century, and in the two succeeding centuries, particularly in the sixteenth, it was one of the dominating schools of Europe. Here Columbus explained his discoveries and here the Copernican system was early accepted and taught. From the middle of the sixteenth century, when the number of students reached 7600, the university sank in size and prestige. It was reorganized in 1769–77, but suffered much from the political disturbances of the nineteenth century. Its present organization dates from 1857. It has a budget of over 150,000 pesetas, about 1200 students, and a library of some 80,000 volumes and 1000 manuscripts. Consult Alejandro Vidal y Díaz, *Memoria histórica de la Universidad de Salamanca* (Salamanca, 1869), and Gustave Reynier, *La vie universitaire dans l'ancienne Espagne* (Paris, 1902).

SAL'AMAN'DER. A kind of gopher. See GOPHER.

SALAMANDER (Lat. *salamandra*, from Gk. *σαλάμανδρα*, salamandra; connected with Pers. *samandar*, salamander). A genus of European tailed Amphibia which inhabit water only in their tadpole state and return to it only to deposit their eggs, generally living in moist places, as under stones, roots of trees, etc. The general form is very similar to that of newts (q.v.), but the tail is round, not flat. Salamanders feed on worms, slugs, snails, and insects. They are inert, sluggish, and timid creatures and are perfectly harmless. The spotted salamander (*Salamandra maculosa*), 6 or 8 inches long, black, with bright-yellow stripes on its sides and livid blue beneath, is widely spread throughout Europe. The black salamander (*Salamandra atra*) is much smaller, black, the body and tail ringed, the tail almost as if formed of beads. It is abundant in the Alps and mountains of southern Germany. Other species are found in Spain, Italy, etc., and in Asia. The genus is not represented in the United States. Salamander, however, in the United States is the common name for all the Urodela.

SALAMANDER, *Ger. pron.* zä'lä-män'dĕr. A German drinking term of uncertain significance. The custom to which the name is applied, called *exercitium salamandri*, originated with the students of Heidelberg about 1830. At the command of the president the drinking vessels are rubbed about in a circle on the table and emptied. The participants then rattle the glasses on the table and set them down with a simultaneous crash. The salamander is the most formal method of drinking a health.

SALAMANTICA. See the first article SALAMANCA.

SAL'AMIS (Lat., from Gk. *Σαλαμίς*; modern name *Kuluri*). A mountainous island of Greece, in the Gulf of Ægina (Map: Greece, Ancient, C 3). It resembles a horseshoe in shape, the opening being to the west. On the northeast it is separated from Attica by a strait about 1 mile in width and on the north by the Bay of Eleusis, at the northwest it approaches close to the Megarian coast. In the northeastern part of the island was the town of Salamis, near the modern Ambelaki, on the bay opposite the Attic coast. The area is about 36 square miles and the population in 1909 was about 6630, almost exclusively Albanians. The island is rocky and mountainous, scantily wooded, and barren, though the coast districts and the valleys yield a little grain and wine. Salamis was early an object of strife between the Athenians and the Megarians (see MEGARA; MEGARIS), but the former secured it early in the sixth century B.C., and from that time it was a part of Attica. Its celebrity is due to the decisive naval battle fought between the Persians and the Greeks in the strait between the long northeastern promontory of the island and the coast of Attica (480 B.C.). Themistocles, by sending word privately to Xerxes that the Greeks were planning to withdraw from the island to the isthmus, led Xerxes to blockade the straits during the night, thus cutting off the escape of the Greeks, and in the morning to enter them for battle. The result was the complete defeat of the Persians, whose superior numbers and unwieldy vessels were unavailing in the narrow waters. Consult: W. W. Goodwin, *Papers of the American School of Classical Studies at Athens*, vol. i (Boston, 1885); G. B. Grundy, *The Great Persian War* (London, 1901); H. Raase, *Die Schlacht bei Salamis* (Rostock, 1904); R. W. Macan's edition of Herodotus, viii–ix, Appendix (London, 1908); K. Baedeker, *Greece* (4th Eng. ed., Leipzig, 1909); *Herodotus*, viii, 40–95, and the commentary thereon by How and Wells, vol. ii (Oxford, 1912); and the article "Salamis," in Friedrich Lübker, *Reallexikon des klassischen Altertums*, vol. ii (8th ed., Leipzig, 1914).

SALAMIS. An ancient city in the middle of the eastern coast of Cyprus (q.v.), the most important place on the island. It has a famous temple of Zeus. Its king, Euagoras (410–364 B.C.), united Cyprus into one Kingdom. The city fell to the Romans in 58 B.C. It was destroyed by an earthquake, but was rebuilt by Constantine the Great, named Konstantia, and again made the capital of the island. It was laid waste by the Arabs. The village Hagios Sergios is near its ruins.

SALAMMBO, sä'läm-bō'. An opera by Reyer (q.v.), first produced in Brussels, Feb. 10, 1890; in the United States, Jan. 25, 1900 (New Orleans).

SALAMMBÔ. A novel by Gustave Flaubert

(1862). The scene is laid in Carthage in the time of Hannibal, whose sister is the title character.

SAL AMMO'NIAC (abbrev. of Lat. *sal ammoniaci*, salt of ammonium). Ammonium chloride (NH_4Cl). It is of great value in medicine, chemistry, and the arts. It is obtained from the ammoniacal water of gas works by adding sulphuric acid and then sublimating the sulphate thus formed with sodium chloride. It may be obtained on a small scale by adding hydrochloric acid to a solution of ammonia. In nature it is found in volcanic regions, as an efflorescence on the surface of rocks or as a sublimate in fissures, crystallized or forming crusts, or stalactites. It occurs as colorless, odorless, translucent fibrous masses, having a bitter saline taste, is freely soluble in water, and has a specific gravity of 1.45. In medicine it is used as an expectorant in bronchitis and pneumonia, being a favorite ingredient of cough mixtures; as a diaphoretic, diuretic, an alterative in rheumatism; as a cholagogue in various derangements of the liver; and as an alterative in neuralgia. In catarrhal inflammations of the gastrointestinal tract it is used to some extent. See AMMONIA.

SALANDRA, sȧ-län'drȧ, ANTONIO (1853–). An Italian statesman, born at Troia, Foggia. He graduated from the University of Naples in 1875 and then became instructor and later professor of administrative law at the University of Rome. In 1886 he was elected a member of the Chamber of Deputies, where he joined the party of Moderate Conservatives. He served as an Undersecretary of Finance in the first Rudini cabinet in 1891–92 and as an Undersecretary of the Treasury in the Crispi cabinet in 1893–96. In the second ministry of Pelloux (1899–1900) he was Minister of Agriculture and in the first (1906) and second (1908–10) Sonnino cabinets held the portfolio of Finance. In March, 1914, Salandra became Premier and Minister of the Interior, succeeding Giolitti, and he retained the same posts when the government was reorganized in November, 1914. Under the popular leadership of this ministry preparations were made to enter the European War (see WAR IN EUROPE), and Salandra remained Premier after Italy had joined the allies in 1915. Like President Wilson of the United States Salandra is regarded as an example of the scholar in politics. He is author of a considerable number of works on economics, finance, history, law, and politics. These include: *Trattato della giustizia amministrativa* (1904); *La politica nazionale e il partito liberale* (1912); *Legioni di diritto amministrativo* (2 vols., 1912); *Politica e legislazione: saggi, raccolti da Giustino Fortunato* (1915); *Il discorso contro la malafede tedesca* (1915).

SALANG, sȧ-läng', or **JUNKSEYLON**, jŭnk'sē-lŏn', or TONGKAH. An island in the Bay of Bengal, belonging to lower Siam, situated at the northern entrance to the Strait of Malacca and separated by a narrow strait from the Malay Peninsula (Map: Siam, C 5). It has an area of about 290 square miles and has rich tin deposits which are mined by Chinese and exported to the adjacent British settlements. Pop., about 12,000.

SALANGANE, sȧl'ȧŋ-gān (Fr., from *salamga*, the native name), or EDIBLE-NEST SWIFT. An East Indian swift of the genus *Collocalia*, of which 13 species are known in the Malayan and Australian regions. All are diminutive in size, dark colored above and white below, with the appearance and habits of swifts, and are of interest mainly because their nests are in demand among the Chinese as the basis of a soup regarded as a luxury. These swifts breed in large companies in sea-fronting caves, attaching their small half-cuplike nests to the rock in the dark interiors of crevices and caverns. The nests have a gluelike consistency and are formed mainly of a glutinous saliva produced by the bird, with which are frequently mixed other materials, as bits of straw, feathers, etc. The principal species is *Collocalia fuciphaga*. See Plate of SWIFTS AND THEIR NESTS.

SALAYER, ISLANDS. A group of 73 islands in the Malay Archipelago, belonging to the Netherlands and situated south of Celebes (Map: East India Islands, F 7). Area, about 270 square miles, of which 250 square miles are covered by Salayer Island. They are composed mainly of coralline limestone covered with very fertile soil and are well forested with valuable timber. The chief products are tobacco, potatoes, indigo, and cotton, and excellent horses are exported to Celebes, with which there is regular steamship connection. Population, mainly mixed Macassars, estimated at 81,000, is engaged in commerce, fisheries, and preparation of trepang.

SALDANHA, sȧl-dä'nyȧ, JOÃO CARLOS DE, DUKE OF (1791–1876). A Portuguese soldier and statesman, a grandson of Pombal, born at Arinhaga. He was the most influential man of his country and time. He studied at Coimbra, served against the British, and was made a prisoner in 1810. On his release he went to Brazil, where he was employed in the military and diplomatic services. He returned to Portugal after the declaration of the independence of Brazil. He became Minister of Foreign Affairs in 1825 and was Governor of Oporto in 1826–27. He joined Dom Pedro against the usurper Dom Miguel, with whom he concluded the convention of Evora. In 1835 he was made Minister of War and President of the Council, but resigned in the same year. After the revolution of 1836, which he had instigated, he went into exile until recalled in 1846, when he formed a ministry, which fell in 1849. In 1851 he organized a new revolt and became Chief Minister as the leader of a coalition party formed of Septembrists and dissatisfied Chartists. He remained in power until 1856, and was subsequently Minister to Rome (1862–64, 1866–69). He became Prime Minister once more for a few months in 1870 (May–August) and was sent in 1871 to London as Ambassador, where he died. Consult Antonio da Costa, *Historia do marechal Saldanha* (Lisbon, 1879).

SALE, sȧ'lȧ. See ISOLA GROSSA.

SALE or **SALES** (AS. *sala*, from *sellan*, Goth., OHG. *saljan*, to give, sell; connected with Lith. *sulyti*, to proffer, offer). A contract whereby the absolute or general ownership of property is transferred from one person to another for a money consideration or loosely for any consideration. In the latter case the transaction is more accurately called a barter, trade, etc. The term "sales" is used specifically by legal-text writers of such transfers of personal property, the treatises on that subject being commonly said to treat of the law of sales. For the treatment of the subject in relation to land, or real property, see CONVEYANCE; DEED; REAL PROPERTY.

Sale of Personal Property. A sale of personal property is often spoken of as a bargain and sale or an executed contract of sale, to distinguish it from a contract to sell, i.e., from a contract to transfer general ownership in the future. At common law this contract could be oral or written. By the Statute of Frauds (q.v.) a contract for the sale of goods must be in writing if the price exceeds a specified sum, generally $50, unless there is an acceptance and receipt of a part of the goods or a part payment of the price. Question often arises under the Statute of Frauds as to whether a transaction involving the manufacture and sale of an article is a sale or merely a contract for work, labor, and materials. Before the adoption of the Uniform Sales Act in many states of the United States there were a variety of tests to determine whether the transaction was a sale or not. Under the Uniform Sales Act the test is whether the article is in stock or whether it must be manufactured to order—the "special order" test. Thus, if the article is made to order the contract is binding even though oral. The general rule has been laid down by the courts that where a bargain is made for the purchase of specific existing goods and no stipulation is made about payment and delivery, the ownership passes at once to the buyer and the right to the price passes to the seller. In Roman law a sale was treated as a conveyance, and tradition, i.e., actual delivery, was necessary to the transfer of title. Again, Roman law required the payment of the price by the purchaser as a condition of title's passing, unless it was waived by the parties. Modern European codes, although founded on the Roman law, generally reject the latter rule, while continuing the former.

Requisites of a Valid Sale or Contract to Sell. In addition to the elements of competency of parties and meeting of the minds, which are common to all contracts (q.v.), it is essential that there be personal property in existence as the subject matter of the transaction and a price in money. The fact that there is a price distinguishes a sale from a gift, and the money element distinguishes a sale from a barter. In case of a bargain and sale the thing sold must then be in existence. At times persons declare that one sells and the other buys specified property which they know is not in existence. This can take effect only as a contract to sell; for it is accounted an elementary principle that a man cannot grant personal property in which he then has no interest or title. Accordingly if, before this contract to sell has been executed by transferring the ownership to the buyer, a creditor of the seller levies an execution (q.v.) on the property, such creditor will be able to keep it. In the United States it is generally held that the owner of property can make a valid bargain and sale of its product, growth, or increase, even before that comes into actual existence; and an unmatured crop may be sold, effectually passing title as of the time of the sale, provided the seeds were planted at the time the transaction is consummated.

When Title Passes. In case of a bargain and sale title passes when the contract is made. In the case of a contract to sell title is to pass in the future. The question on principle is to be decided in accordance with the intention of the parties, and if they clearly and definitely state the time or condition of passing title, no difficulty arises. In the hurry and rush of modern business life, however, such definiteness is often neglected.

Rule 1. Where there is a contract for the sale of specific goods and the seller is bound to do something to the goods for the purpose of putting them into a deliverable state, the title does not pass until such thing is done. In England it does not pass until the buyer is notified that the thing is done.

Rule 2. When there is a contract for the sale of unascertained or future goods by description and goods of that description and in a deliverable state are unconditionally appropriated to the contract either by the seller with the assent of the buyer or by the buyer with the assent of the seller, the title thereupon passes to the buyer. Such assent may be express or implied, and may be given either before or after the appropriation is made.

The difficult questions under this rule are, first, whether the required assent has been given, and second, whether the appropriation is unconditional. The principal examples of a conditional appropriation are afforded by shipments of goods C. O. D. and under bills of lading (q.v.), which make the goods deliverable to the seller or his agent or his assignee. If the seller takes a bill of lading, making the goods deliverable to the buyer, and does not require payment for the goods as a condition of title's passing, the appropriation is unconditional so far as he is concerned. Then the question arises whether the buyer has assented to such appropriation. Generally speaking he does assent where he orders goods to be sent to him by a common carrier, provided the goods sent are of the kind and quality which he ordered. The mere fact that the goods sold are intermingled with a large quantity of other goods of similar grade and quality, as in the case of grain, will not prevent a passing of title. Under certain circumstances also, notably the insolvency of the buyer, the seller is given a right of stoppage in transitu (q.v.) even though the title has passed.

It is often quite important to determine whether title passed at the time of shipment; for if it did, any loss or injury of the goods during their transit must be borne by the buyer, the general rule being that the risk of loss or harm goes with the title, unless the parties have otherwise agreed.

Conditions and Warranties. Before the passage of the Uniform Sales Act the questions relating to conditions and warranties were among the most perplexing topics in the law of sales, and even to-day considerable confusion exists in some jurisdictions by considering warranties, and especially implied warranties, as conditions. The English Sale of Goods Act of 1893 (56 and 57 Vict., c. 71) has simplified this topic by defining "condition" and "warranty," by classifying the various engagements of the seller, and by describing the consequences of their breach. The late tendency of the various State Legislatures in the United States to codify the law of sales and the adoption in many states of the Uniform Sales Act, similar in many respects to the English Sale of Goods Act, have done much towards simplifying the law and avoiding the many conflicts of authority which previously existed. See CAVEAT EMPTOR; MARKET OVERT; STOPPAGE IN TRANSITU.

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SALE, George (1697–1736). A translator of the Koran. He was the son of a London merchant, was admitted to the Inner Temple in 1720, and afterward practiced as a solicitor. He early began the study of Arabic and acquired a thorough mastery of the language and a close acquaintance with Mohammedan thought and customs, although he never left his native land. From 1726 till 1734 he was connected with the Society for the Promotion of Christian Knowledge, for which he prepared an Arabic translation of the New Testament, besides acting as legal adviser, business manager, and in other capacities. His translation of the Koran, published in London in 1734 and many times reprinted, while not very literal, was greatly in advance of any earlier version and a remarkable performance for the time. The material incorporated from Mohammedan authorities renders it a commentary as well as translation, and the notes and preliminary discourse are still of value.

SALE, Sir Robert Henry (1782–1845). A British soldier, popularly known as the hero of Jelalabad. He was born in England and was the second son of Colonel Sale, of the East India Company's service. He took active part in the Burmese War of 1824–26, distinguishing himself at Rangoon, Bassein, and especially at Prome. In 1838 he was given command of the First Bengal Brigade of the army on the Indus in the Afghan expedition, and was severely wounded while leading the storming party at Ghazni. In 1840 he was sent to Kohistan against Dost Mohammed and, after the capture of several fortresses, forced him to surrender at Parwan. When the Afghans rose against the British at the close of 1841, Sale, after forcing his way through the Khurd-Kabul, Tezin, and Jagdalak passes, was driven back upon Jelalabad, where he was besieged by Akbar Khan, son of Dost Mohammed. On April 7, 1842, he made a sortie and routed the Afghans, capturing their ammunition, guns, and camp. He was relieved by Pollock, commanding the punitive expedition against the Afghans, and participated with him in the recapture of Kabul. Sale was wounded on Dec. 18, 1845, fighting against the Sikhs at Mudki, and died three days later.

SA'LEM. The capital of a district of the same name in the Province of Madras, India, 207 miles southwest of the city of Madras, on the Tirumanimuttar River (Map: India, C 7). It is attractively situated in the hilly Shevaroy region and has a college and high schools. Weaving and the manufacture of carpets and cutlery are important industries. In the vicinity there are rich deposits of iron and limestone. Pop., 1901, 70,621; 1911, 59,153.

SALEM. A city and the county seat of Marion Co., Ill., 72 miles by rail east of St. Louis, Mo., on the Baltimore and Ohio Southwestern and the Chicago and Eastern Illinois railroads, and the terminus of the Illinois Southern (Map: Illinois, G 8). There are coal deposits and mineral springs in the vicinity. Yards, shops, and a roundhouse of the Chicago and Eastern Illinois Railroad are situated here. The city possesses a public library, hospital, and fine courthouse. Pop., 1900, 1642; 1910, 2669.

SALEM. A city and one of the county seats of Essex Co., Mass., 16 miles northeast of Boston, on the Boston and Maine Railroad (Map: Massachusetts, F 2). It was the original settlement of the Bay Colony (1626) and important throughout the Colonial period. Many dwellings still well preserved date from that time, as Hawthorne's birthplace (1685), Witch house (1674), House of the Seven Gables (1696). There are some 400 acres of parks, the most important being Washington Square (central), Mack (west), Gallows Hill, Highland, and the Willows and Forest River (on the harbor). There are a high school, State Normal School, the Plummer Farm and Trade School, the Essex Institute (with several buildings containing a library of 115,500 volumes, 404,000 pamphlets, many fine paintings, and a "historic New England" collection), also the Athenæum, 27,000 volumes, and a public library having 60,315 volumes. The Peabody Academy of Science is a museum of interesting East Indies, Japanese, and Pacific Islands collections, the first exhibit coming from Sumatra in 1799. The city has an almshouse, asylums and hospitals, and two homes for the aged. From early years till 1860 Salem was a great trading port, vessels sailing to Europe, Africa, and India, and there were shipyards in operation from 1755 to 1880. At present its manufactures are of considerable importance, representing in 1914 an invested capital of $9,824,000. The product of its 178 industries was valued at $13,453,000. The chief articles were shoes, cotton cloth, hides and leather, lumber products, and machinery. The municipal council consists of five members chosen at large and one from each of the six wards. These are chosen for terms of two years, the ward councilors and members at large being elected in alternate years. The mayor is elected for two years, and appoints or removes the heads of departments with the approval of the council. The total expenditure in 1913 was $1,703,241, the largest items being schools, $180,796, and streets, $122,307. Pop., 1900, 35,906; 1910, 43,697; 1915, 36,826; 1920, 42,529.

Under the old Indian name Naumkeag this earliest Massachusetts settlement after Plymouth was made in 1626 by Roger Conant and 27 others. John Endecott came with a small colony in 1628, and under his charter laid out streets and lots, with certain rights to the original planters. The next year the name was changed to Salem. Roger Williams (q.v.) removed there from Plymouth in 1633 and began to preach freedom of thought and religious liberty. Persecutions arose and he left the settlement, finding a more peaceful haven at Providence Plantation. The Quakers were beset by troubles with the magistrates in 1656–60 and the witchcraft delusion spread in the neighborhood (Salem Village, now Danvers) in 1692. Accusations and outcries of a few children that certain old women worked charms or evil eye upon them soon grew into other charges, and 19 persons were hanged and 1 pressed to death. This lasted through one summer. Others held were later released. The town grew and prospered, even in revolutionary days, successfully resisting the seizure of cannon by Colonel Leslie and a British force at North River Bridge, Feb. 26, 1775. Salem became a city in 1835. Some of its well-known men have been: Alexander Graham Bell; Bowditch the

navigator; Nathaniel Hawthorne, whose work up to and including *The Scarlet Letter* was done there; Gen. James Miller (of Lundy's Lane), collector of customs while Hawthorne was port surveyor; Joseph E. Worcester, lexicographer; Judge Joseph Story; his son William W. Story the sculptor; Abiel Abbot Low, later a wealthy New York philanthropist; William Frederick Poole, librarian; Ernest Fenollosa; F. W. Benson, artist; John Rogers the sculptor; and Moses G. Farmer, electrician (qq.v.). The city suffered from a great fire June 25, 1914; about one-third of its thickly settled portion was burned and 15,000 people were made homeless. The total loss was over $12,000,000. By the end of 1915 more than a third of the ruined property had been rebuilt.

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SALEM. A city and the county seat of Salem Co., N. J., 38 miles by rail south by west of Philadelphia, on the Salem River, near its confluence with the Delaware, and on the West Jersey and Seashore Railroad and the Salem and Philadelphia Steamboat Line (Map: New Jersey, B 4). It is an attractive residential place and has the John Tyler Library, a fine high school, and a Friends' meeting house, erected in 1772 and still in use. Salem is an important industrial centre, its principal establishments including glassworks, fruit and vegetable canneries, and manufactories of oilcloth, women's garments, iron castings, machinery, and carriages. Pop., 1900, 5811; 1910, 6614.

Settled in 1675 by John Fenwick and a company of Quakers, Salem was incorporated as a town in 1695 and became a city in 1858. During the Revolution it was alternately occupied by British and American troops. Consult Johnson, *An Historical Account of the First Settlement of Salem* (Philadelphia, 1839), and publications of Salem County Historical Society.

SALEM. A city in North Carolina. See WINSTON-SALEM.

SALEM. A city in Columbiana Co., Ohio, 70 miles southeast of Cleveland, on the Pennsylvania and the Youngstown and Ohio railroads (Map: Ohio, J 4). It has a Carnegie library, new city hospital, a home for aged women, city park, and a fine government building. Salem, the centre of a coal-mining region, manufactures engines, steel, wire nails, pumps, tools, pipe organs, motor boats, feed cutters, riveting machines, china, stoves, furniture, etc. Settled in 1807, Salem was incorporated as a village in 1830 and was chartered as a city in 1887. It was a station of the Underground Railway (q.v.) before the Civil War. Pop., 1900, 7582; 1910, 8943; 1915 (U. S. est.), 9661; 1920, 10,305.

SALEM. The capital of Oregon and the county seat of Marion County, 52 miles south of Portland, on the Willamette River and on the Southern Pacific, the Oregon Electric, and the Salem Falls City and Western railroads (Map: Oregon, B 3). It is situated on ground rising gradually from the river, and has wide and beautifully shaded streets. The State capitol, a handsome building surmounted by a high dome, occupies a site overlooking the city. Other prominent structures are the Federal Building, City Hall, Supreme Court Building, State Penitentiary, State Insane Asylum, Tuberculosis Hospital, Hospital for the Feeble-Minded, and the Opera House. Salem is the seat of Willamette University, originally founded by the Methodist Episcopal church as an Indian school and opened as a university in 1844, the Academy of the Sacred Heart, and a large Indian Training School. The State School for Deaf Mutes, the State Institute for the Blind, the State Fair Grounds, and the State Reform School also are here. The State Library has 103,000 volumes, and there are also in the city Masonic and Odd Fellows libraries. Salem is surrounded by a region having extensive fruit, hop, and wheat interests, and is of considerable industrial importance. There are three loganberry-juice plants, large fruit driers, and hop yards and driers. Flour, woolens, foundry and lumber products, and machinery constitute the leading manufactures. The government is vested in a mayor and a unicameral council. Pop., 1900, 4258; 1910, 14,094; 1915 (U. S. est.), 19,282; 1920, 17,679.

Salem was chartered as a city in 1853. In 1864, by a popular vote, it was made the permanent State capital, and in 1857 the Constitutional Convention held a session here.

SALEM. A town and the county seat of Roanoke Co., Va., 7 miles west of Roanoke, on the Roanoke River and on the Virginian and the Norfolk and Western railroads (Map: Virginia, D 4). The town is the seat of Roanoke College (Lutheran), opened in 1853, and Elizabeth College and Conservatory of Music (for women), and has Lutheran and Baptist orphanages, a fine courthouse, and Federal buildings. There are deposits of iron and several sulphur springs. Salem manufactures leather, glass, wagons, agricultural implements, machinery, brick, mattresses, woolen goods, etc. Settled in 1802, Salem was incorporated in 1836 and received its present charter in 1892. Pop., 1900, 3412; 1910, 3849.

SALEMI, sȧ-lā′mē (Lat. *Halicyæ*). A city in the Province of Trapani, Sicily, 64 miles by rail southwest of Palermo (Map: Italy, D 6). It is situated on a hill 1450 feet above the sea and 4 miles west of the railway station. It has a ruined castle, a library, a technical school, and a Gymnasium, and markets grain, wine, oil, and cattle. Pop. (town), 1911, 10,759.

SALERANO, FEDERIGO, COUNT SCLOPIS DI. See SCLOPIS DI SALERANO, FEDERIGO, COUNT.

SAL′ERA′TUS (Neo-Lat., formerly *sal aëratus*, aërated salt). A name applied to acid potassium carbonate, which was formerly much used in cooking, as sodium bicarbonate (cooking soda) is used at present. It still finds some use in medicine.

SALERNO, sȧ-lĕr′nō (Lat. *Salernum*). The capital of the Province of Salerno (formerly Principato Citeriore), Italy, and the seat of an archbishop. It is beautifully situated at the head of the Gulf of Salerno, 34 miles southeast of Naples (Map: Italy, E 4). The principal street is the Corso Garibaldi along the water front. There are good hotels, a municipal

theatre, three hospitals, and normal, classical, and technical schools. The medical school of Salerno was the doyen of medical faculties in Europe. (See SALERNO, SCHOOL OF.) The Cathedral San Matteo was built by Robert Guiscard (q.v.) and dedicated in 1084, but suffered by the restoration of 1768. Along the walls of the atrium are 14 ancient sarcophagi used for Christian burials by the Normans. The bronze doors, made in Constantinople, date from the eleventh century, and in the interior are ancient mosaics and frescoes. On the hill above the town are the ruins of a Lombard castle. Salerno markets wine, oil, fruit, cotton, tobacco, and silk, and manufactures cotton and woolen goods. The ancient Salernum, which at the time of the Second Samnite War still belonged to the Samnites, became later a Roman colony. After the fall of the Western Empire the town was successively held by the Lombards, the Normans, and the houses of Hohenstaufen and Anjou. Pop. (commune), 1901, 42,727; 1911, 45,682. Consult Schipa, *Storia del principato longobardo di Salerno* (Naples, 1887), and Edward Hutton, in *Naples and Southern Italy* (New York, 1915).

SALERNO, GULF OF, or GULF OF PÆSTUM. An arm of the Mediterranean Sea, on the west coast of Italy, southeast of the Bay of Naples (Map: Italy, E 4). It is 36 miles wide at its entrance and sweeps inland for 24 miles. On its shores are the towns of Amalfi and Salerno.

SALERNO, SCHOOL OF. A once famous medical school at Salerno, Italy. As early as the tenth century Salerno was famous for its numerous physicians. Ordericus Vitalis (q.v.), who first mentions the medical school, ascribes to it an ancient origin, but the attempt to trace its inception to Saracen influence has been refuted by Henschel, Daremberg, and De Renzi. After the middle of the eleventh century the system of medicine known as methodism, in vogue at Salerno, whose chief representative in antiquity was Cælius Aurelianus, gave way to that of humorism, based on Hippocrates and Galen, and from this time dates the medical renaissance. In 1253 the faculties of Naples were transferred to Salerno, thus transforming it into a university for a short time. They, however, returned to Naples in 1258, the union not having realized the anticipated prosperity. Women studied and taught there, thus anticipating our coeducational institutions. The introduction of Arabic medicine in other medical institutions was the main cause of decline of the school. In the beginning of the fourteenth century its prestige had completely passed away, and thenceforth its decline continued until in 1811 it was reduced to a mere Gymnasium and in 1817 it ceased to exist.

SALES, SAINT FRANCIS DE. See FRANCIS DE SALES.

SALESIAN (sȧ-lē′shan) **SISTERS.** See VISITATION, SISTERS OF THE.

SALEYER (sȧ-lī′ẽr) **ISLANDS.** A group of islands near Celebes. See SALAYER ISLANDS.

SALFORD, sąl′fẽrd. A municipal borough in Lancashire, England, virtually a portion of the city of Manchester (Map: England, D 3). It possesses an older municipal history than its larger neighbor, having obtained its first charter in 1231 and a charter of incorporation in 1844. Several railway viaducts and 16 bridges connect it with Manchester. The borough covers an area of 8 square miles; it has fine libraries and a museum and art gallery in the beautiful Peel Park, one of four parks with a total area of 83 acres. Pop., 1901, 220,956; 1911, 231,357. Consult: *Victoria History of the County of Lancashire* (8 vols., London, 1906–14).

SALGÓTARJÁN, shŏl′gō-tŏr-yän. A town of Hungary, in the County of Nógrád, 78 miles by rail northeast of Budapest (Map: Austria-Hungary, F 2). The coal-mining interests are important and the town has ironworks. There are, for working men, a hospital, baths, and schools. Pop., 1900, 13,552; 1910, 14,342.

SAL′ICIN (from Lat. *salix*, willow), $C_6H_4(OH)CH_2(OC_6H_{11}O_5)$. A member of the group of organic compounds to which the term "glucosides" is applied by chemists—a group which is specially characterized by the fact that each of its members, when exposed to the action of dilute acids or of ferments, takes up water and breaks up into sugar and other compounds. Salicin occurs in the bark of the various species of willow and poplar. It may be obtained in small, colorless, glistening prisms of an intensely bitter taste, which are readily soluble in hot water and in alcohol, moderately soluble in cold water, and insoluble in ether and chloroform. If introduced into the body, salicin is decomposed with formation of salicylic acid, which is then rapidly absorbed, probably in the form of its sodium salt. The physiological action of salicin is therefore in almost all respects identical with that of salicylic acid (q.v.). Salicin, however, has a much less irritating effect on the stomach and a much weaker depressing effect on the heart than free salicylic acid.

SAL′IC LAW (*Lex Salica*). One of the earliest of the so-called laws of barbarians, which were put into written form in very corrupt Latin between the middle of the fifth and the beginning of the ninth century and which set forth the customary law of the different German tribes. The Lex Salica contains a part of the law governing the Salian or Merovingian Franks. A prologue of much later date than the Lex itself places its composition in a period in which the Franks were governed by many chiefs (*proceres*); but from internal evidence the Lex is believed to have been drawn up in the reign of Clovis and about the close of the fifth century. It consists largely of tariffs of compositions to be paid for various injuries and it deals mainly with what we should call the law of torts and crimes and the law of procedure. Of its original 65 titles only six or seven are devoted to the law of family, property, and inheritance. The older manuscripts contain the so-called Malberg gloss —interpolated Frank words and phrases which serve in some cases to explain the Latin words, in other cases to indicate the formal words to be employed in legal proceedings.

During the following three centuries much new matter was inserted by private copyists, a fact which renders the reconstruction of the original text more or less uncertain. A revised text, dating from the Carolingian period, in which the Latin was purged of its worst barbarisms and the Malberg gloss eliminated, is known as the Lex Emendata. The term "Salic law" is often applied exclusively to that part of the law which relates to inheritance by women. The paragraph reads as follows: "But of Salic land, no portion of the inheritance shall come to a woman; but the whole inheritance of the land shall come to the male sex." It is evident that there is no question here of a woman's inheriting the throne, as is popularly supposed. The

term "Salic law" was first employed, in this sense, in connection with the exclusion of women from the throne in France in the fourteenth century, during the struggle between Philip VI and Edward III of England for the French crown. This law was introduced into Spain by Philip V in 1714, but was revoked again by Ferdinand VII in 1830.

Bibliography. The best texts are by J. H. Hessels (London, 1880); Alfred Holder (Leipzig, 1879–80); Heinrich Geffcken (ib., 1898). A new one is being prepared by Mario Krammer, see *Neues Archiv*, vols. xxx and xxxix (Hanover, 1905–14). The literature, which is extensive, is cited in Heinrich Brunner, *Deutsche Rechtsgeschichte*, vol. i (2d ed., Leipzig, 1906), and in Dahlmanes-Waitz, *Quellenkunde der deutschen Geschichte* (8th ed., by Paul Herre, ib., 1912).

SAL'ICYL'ATES (from Lat. *salix*, willow), MEDICAL USES OF THE. The chief salicylates are those of sodium and lithium, together with methyl salicylate or in the form of oil of wintergreen. They are employed in the place of salicylic acid, because they are less irritating to the stomach, less depressing to the heart, and less liable to give rise to the disagreeable train of symptoms called salicylism. The more marked of these are ringing in the ears, deafness, partial blindness, headache, vomiting, and delirium. The chief use of the salicylates is in rheumatism, in many acute cases of which they seem to possess a specific effect. The sodium salt is more effective in acute, the lithium salt in chronic, rheumatism. When given in rheumatic fever sodium salicylate and salicylic acid cause a fall of temperature and marked relief from pain, and it is thought they diminish the likelihood of the cardiac complications so characteristic of this disease. (See RHEUMATISM.) Sodium salicylate is used with success for causing the absorption of pleural effusions, in conjunction with purgatives and diuretics. In quinsy and true tonsillitis, especially of rheumatic origin, the salicylates will often prevent suppuration, shorten the attack, and promptly relieve the pain and swelling.

Mercury salicylate has the properties of a mercurial rather than those of salicylic acid and is employed as a hypodermic injection in urgent cases of syphilis. *Bismuth salicylate* is an intestinal antiseptic much used in Europe. *Magnesium salicylate* has recently been introduced as an intestinal antiseptic. *Strontium salicylate* has similar properties. See SALICYLIC ACID.

SAL'ICYL'IC ACID, $C_6H_4(OH)COOH$. A compound of carbon, hydrogen, and oxygen, existing in combination in various plants. It is the chief component of oil of wintergreen, which is obtained by distilling the blossoms of the *Gaultheria procumbens;* it is likewise combined in the volatile oil of betula, obtained by distilling the bark of the sweet birch (*Betula lenta*). Small quantities of it have been found in very many fruits. Salicylic acid is employed in the manufacture of certain dyestuffs; and as it has no odor and acts as a powerful antiseptic, it is extensively used for the preservation of various articles of food, such as eggs, milk, fruit, pickled vegetables, etc. It is also added to wine and beer to check fermentation and thus to prevent the formation of deleterious products. In small quantities the acid is perfectly harmless. If the food, however, is very poor, it requires a rather large amount of acid to mask its disagreeable qualities and keep it fit for sale. Now, the combined effect of spoiled food and a great deal of the acid may be more or less injurious, and therefore the addition of salicylic acid to beer has, in several European countries, been forbidden by law. The salts of salicylic acid do not possess the antiseptic properties of the acid. The salt most commonly used is the salicylate of sodium, a white powder very soluble in water and having a sweetish, saline taste.

Salicylic acid is manufactured either from oil of wintergreen or from carbolic acid (phenol). Oil of wintergreen is composed mainly of methyl salicylate, the ethereal salt or ester formed by the combination of methyl alcohol with salicylic acid. When the ester is boiled with caustic potash it decomposes into its constituents, and thus the acid is obtained in the form of its potassium salt. Hydrochloric acid readily takes up the metal of the latter, setting free its salicylic acid, which may then be rendered pure by recrystallization from alcohol. More usually, however, salicylic acid is manufactured from phenol. Phenol (carbolic acid) combines with caustic soda, yielding sodium phenate; and when the latter is heated to 120° to 140° C. (250° to 285° F.) with carbonic-acid gas under pressure, or preferably with liquid carbonic acid in closed iron vessels, the sodium salt of salicylic acid is produced. This salt is decomposed with hydrochloric acid, and the salicylic acid set free is purified by recrystallizing from ordinary alcohol or preferably by distilling with a current of steam.

When heated with lime salicylic acid loses the elements of carbonic acid and is reconverted into phenol. Pure salicylic acid is a white crystalline substance, very soluble in alcohol, sparingly soluble in water, and having a sweetish-sour taste. Its presence in a given article is usually detected by means of ferric chloride, which imparts to solutions of the acid an intense violet coloration, which remains unchanged on addition of some drops of lactic acid.

SALIDA, sȧ-lī'dȧ *or* -lē'dȧ. A city in Chaffee Co., Colo., 97 miles west by north of Pueblo, on the Denver and Rio Grande Railroad (Map: Colorado, C 3). It is situated in a region noted for its mineral wealth and for its rich agricultural lands. There are a smelting plant, marble works, granite quarries and finishing plants, and repair and construction shops of the Denver and Rio Grande Railroad. A public library, Riverside Park, Alpine Park, the high school, two hospitals, Elks Home, and the hot mineral springs are features. Pop., 1900, 3722; 1910, 4425.

SA'LIENT (Fr. *sallient*, from Lat. *saliens*, pres. p. of *salire*, to leap). In heraldry (q.v.), a lion or other beast of prey represented in the act of springing forward or leaping in bend.

SALIENT. See FORTIFICATION.

SALIENTIA, sȧ'lĭ-ĕn'shĭ-ȧ. See ANURA.

SALIERI, sȧ-lyā'rē, ANTONIO (1750–1825). An Italian composer, born in Legnano. In 1765 he entered the San Marco singing school, Venice, and shortly afterward went to Vienna as a pupil of Gassmann. In 1770 he produced his first opera, *Le donne letterate*, with great success. He was a very popular composer in his time, but is now almost entirely forgotten. His chief fame was as a composer of dramatic and church music. Of his operas *Les Danaïdes* (1784) and *Tarare* (1787) are considered the best. He wrote in all 46 operas, 3 oratorios, 8 cantatas, 2 symphonies, and many miscellaneous compositions.

Among his pupils were Beethoven and Schubert. He died in Vienna.

SALIGRAMI, sä'lē-grä'mē. A river of India. See GANDAK.

SALII, sā'lī-ī (Lat., dancers; cf. Lat. *salire,* to dance). A Roman priesthood, consecrated to the service of the war gods Mars and Quirinus (qq.v.). They existed in both the communities that combined to form the city of Rome (see ROME, *Ancient Rome,* first paragraph). The Salii of the Palatine (*Salii Palatini*) served Mars, those of the Quirinal (*Salii Collini,* or *Agonenses* or *Agonales*) originally Quirinus. Later the joint body was regarded as under the protection of Jupiter, Mars, and Quirinus. The Salii were performers of the war dances in honor of the god (or gods). Each body numbered 12, and each had its own head and ritual. They wore the old military garb, a blood-red tunic, breastplate, and pointed helmet, and carried a sword, and especially the sacred shields (*ancilia*), kept always in the Regia, one of which, it was said, had fallen from heaven during the reign of Numa (q.v.). Since it was believed that the perpetuity of Rome depended on the preservation of this miraculous shield, Numa had 11 others like it made, to increase the difficulty of stealing the fateful shield. Their festivals were the Quinquatrus in March, i.e., at the opening of the campaigning season, and the Armilustrium in October, when the purifications for the closed campaign were made. Consult: J. Marquardt, *Römische Staatsverwaltung,* vol. iii (2d ed., Berlin, 1885); W. W. Fowler, *Roman Festivals* (London, 1899); id., *The Religious Experience of the Roman People* (ib., 1911); Georg Wissowa, *Religion und Kultus der Römer* (2d ed., Munich, 1912).

SALINA, sä-lē'nä. One of the Lipari Islands (q.v.).

SALINA, sä-lī'nä. A city and the county seat of Saline Co., Kans., 100 miles west of Topeka, on Smoky Hill River and on the Union Pacific, the Missouri Pacific, the Chicago, Rock Island, and Pacific, and the Atchison, Topeka, and Santa Fe railroads (Map: Kansas, E 5). It is the seat of Kansas Wesleyan University (Methodist Episcopal), opened in 1886. The city has among its institutions St. John's Military School, a Carnegie library, two hospitals, Oak Dale Park, and fine government, high-school, and Y. M. C. A. buildings, city hall, and courthouse. There are several grain elevators, two large wholesale groceries, and manufactories of flour, carriages, candy, rugs, mattresses, and foundry products. Pop., 1900, 6074; 1910, 9688; 1915 (U. S. est.), 11,726; 1920, 15,085.

SALINA CRUZ, sä-lē'nä krōōz. A seaport in the State of Oaxaca, Mexico, on the Pacific Ocean a few miles south of Tehuantepec (Map: Mexico, L 9). It is the Pacific terminus of the Tehuantepec National Railway (see TEHUANTEPEC, ISTHMUS OF), has a good harbor, and is connected with foreign countries by numerous steamship lines. Pop., 1910, 5976.

SALINAN (sä-lē'nan) **STOCK.** An almost extinct family of Indians formerly in Monterey Co., Cal. Little is known of their culture, and but 16 of them were alive in 1910.

SALINAS, sä-lē'nas. A city and the county seat of Monterey Co., Cal., 118 miles by rail southeast of San Francisco, on Salinas River and on the Southern Pacific and the Pajaro Valley Consolidated railroads (Map: California, D 6). Flour and machine-shop products constitute the leading manufactures. The Spreckels beet-sugar factory is near here. Salinas has a Carnegie library, hospital, city hall, and courthouse. Pop., 1900, 3304; 1910, 3736.

SALINA (sä-lī'nä) **STAGE.** A subdivision of the Silurian system receiving its name from Salina, N. Y., and comprising a series of shales and marls with beds of rock salt and gypsum. The rocks are of most importance in New York, Ohio, and Pennsylvania, where they are the basis of an extensive salt industry. See SILURIAN SYSTEM.

SALINS, sà'lăN'. A watering place in the Department of Jura, France, 30 miles south by west of Besançon, on the Furieuse River (Map: France, N., L 6). It is situated amid picturesque scenery and has numerous mineral springs. The extensive thermal establishment in which the salt of the springs is prepared for the market is one of the chief buildings in the town. Pop., 1901, 5525; 1911, 5143.

SALISBURY, sąlz'ber-ĭ, or NEW SARUM. The capital of Wiltshire, England, an episcopal city on the Avon, at its junction with two affluents, 81 miles west-southwest of London and 23 miles northwest of Southampton (Map: England, E 5). The town dates from 1220, in which year the cathedral was founded. The cathedral, the principal building of Salisbury, is one of the finest specimens of early English architecture. It was completed in 1285. The spire is the "most elegant in proportions and the loftiest in England." Its height from the pavement is 406 feet. The cathedral is 473 feet long; height in the interior, 81 feet; width of great transept, 203 feet. It is in the form of a double cross, is perfect in its plan and proportions, and in the main uniform in style. The west front is beautiful and graceful, though now stripped of statues with which it was once enriched. Other interesting buildings are the bishop's palace, the deanery, the King's house, the hall of John Halle, and the Poultry Cross with six arches built in 1330. There are a fine museum, several important educational institutions, and many charities. The town maintains its water supply, markets, river baths, technical school, public library, sewage farm, and two cemeteries. The trade is chiefly agricultural. Pop., 1901, 17,100; 1911, 21,217. Consult Gleeson White, *Salisbury Cathedral,* in "Bell's Cathedral Series" (London, 1901), and Ella Noyes, *Salisbury Plain: Its Stones, Cathedral, City Villages, and Folk* (ib., 1913).

SALISBURY. A town in Litchfield Co., Conn., 63 miles northwest of Hartford, on the west bank of the Housatonic River and on the Central New England Railway (Map: Connecticut, B 2). The region is noted for numerous lakes and picturesque scenery. The town contains the Hotchkiss School, Salisbury School, State Training School for the Feeble Minded, and the Scoville Memorial Library. Iron mining and farming are important, and there are manufactories of cutlery, car wheels, rubber goods, and foundry products. Settled in 1720 and named in 1738, Salisbury was incorporated as a town in 1741. Pop., 1900, 3489; 1910, 3522. Consult Rudd, *An Historical Sketch of Salisbury* (New York, 1899), and *Historical Collections Relating to the Town of Salisbury,* published by the Salisbury Association (Lakeville, 1913 et seq.).

SALISBURY. A city and the county seat of Wicomico Co., Md., 100 miles southeast of

Baltimore, on the Wicomico River and on the Baltimore, Chesapeake, and Atlantic and the New York, Philadelphia, and Norfolk railroads (Map: Maryland, H 4). It has important lumber interests, repair shops of the Baltimore, Chesapeake, and Atlantic Railroad, and extensive canning establishments. Flour, baskets, fertilizers, building materials, shirts and underwear, and lumber products also are manufactured. The city has a hospital and a home for the aged. Pop., 1900, 4277; 1910, 6690.

SALISBURY. A city and the county seat of Rowan Co., N. C., 118 miles west of Raleigh, on the Southern Railway (Map: North Carolina, B 2). It has shops of the Southern Railway and manufactories of cotton goods, foundry and lumber products, felt mattresses, wagons, carriages, concrete roofing tile and brick, and produces granite and fine veneering. Salisbury is the seat of Salisbury Normal and Industrial College for Women, Livingstone College (African Methodist Episcopal Zion), opened in 1882, and of the colored State Normal School. A Confederate military prison was situated here during the Civil War. The National Cemetery contains 12,145 graves including 12,035 of unknown dead. Pop., 1900, 6277; 1910, 7153; 1920, 13,884.

SALISBURY, Edward Elbridge (1814–1901). An American Orientalist, born in Boston. He graduated from Yale in 1832 and later studied in Paris and Berlin. In 1841 he was appointed professor of Arabic and Sanskrit at Yale. In 1854 he surrendered his Sanskrit work to Whitney, remaining professor of Arabic until 1856. He endowed the Sanskrit professorship of Yale, and later gave his Oriental library to the university. He was a prolific contributor on Oriental subjects to the *Journal of the American Oriental Society*, of which he was the leading spirit for many years. Among his works are a *Discourse on Arabic and Sanskrit Literature* (1843) and *Principles of Domestic Taste* (1877). Consult Hopkins, *India, Old and New* (New York, 1901).

SALISBURY, John of. See John of Salisbury.

SALISBURY, Robert Arthur Talbot Gascoyne-Cecil, third Marquis of (1830–1903). An English statesman, born at Hatfield, Hertfordshire, Feb. 3, 1830, a lineal descendant of Lord Burleigh and Robert Cecil, first Earl of Salisbury. He was trained at Eton, received his bachelor's degree at Christ Church, Oxford, in 1849, and in 1853 was elected fellow of All Souls College. The same year he entered Parliament for Stamford. He soon began to be considered as a distinct force among the Conservatives. In 1865 his elder brother died and he became heir to the marquisate and assumed the courtesy title of Viscount Cranborne. In the Derby ministry of 1866 Lord Cranborne was taken into the cabinet as Secretary of State for India. After holding the office for less than a year he resigned because of his opposition to the Reform Bill brought in by his colleagues. In 1868 his father died and he was transferred to the House of Lords as Marquis of Salisbury. In 1869 he became chancellor of the University of Oxford. This was a distinct recognition of his attitude towards Church questions, for from his entrance into public life he had been a vigorous defender of the Church of England. From 1868 to 1874, the period of Gladstone's first ministry, Salisbury was not a very conspicuous figure in politics, but when the Conservatives, under Disraeli, returned to power in 1874, Salisbury again entered the cabinet as Secretary of State for India. He was almost the only Minister who heartily supported the new Premier's imperialist policy. Because of his agreement with his chief on this point and his knowledge of Eastern affairs, he was chosen in 1876 as the British representative to the Conference of Constantinople, which was called with a view of forcing reforms upon the Porte. Two years later Lord Derby withdrew from the cabinet and Salisbury took his place as Secretary of State for Foreign Affairs. In this capacity he accompanied Lord Beaconsfield as plenipotentiary to the Congress of Berlin, but gained little glory from the mission, as he seemed to have been entirely subservient to the Premier and his jingo policy. Upon the death of Lord Beaconsfield in 1881 Lord Salisbury was chosen leader of the Conservative party, and after the resignation of the Gladstone ministry in June, 1885, became head of the government, taking for himself the Department of Foreign Affairs. The Conservatives went out of office in January, 1886, only to come back in July, after the adoption of Home Rule by Gladstone had disrupted the Liberal party and sent a large faction under Lord Hartington and Joseph Chamberlain into the Conservative ranks. In 1887 Lord Salisbury once more assumed as Premier charge of foreign affairs. He went out of office in 1892 and again returned to power in 1895. In 1900 he was succeeded in the Foreign Office by Lord Lansdowne, remaining, however, at the head of the cabinet as Lord Privy Seal. On July 11, 1902, Lord Salisbury resigned his office and was succeeded by his nephew, Arthur Balfour. During his long tenure of office Lord Salisbury attained a leading position among European diplomats, his policy being characterized in general by a spirit of moderation which brought him much criticism from those Englishmen who viewed with jealous eyes the development of ambitious world policies by the continental Powers. Events of international importance in which Lord Salisbury was concerned were the misunderstanding with the United States concerning Venezuela in 1895–96, the adjustment of the difficult question of Crete (1897), as well as the delimitation of the British and German spheres of influence in Africa (1890). Among English statesmen he ranks high, not for any one great quality or particular achievement, but because of the success that during nearly 15 years of Imperial rule attended his policy of conservative caution. In tastes and sentiments an aristocrat, he did not shrink from expressing his disapproval of democracy, in his characteristically cynical but witty fashion. He died at Hatfield, Aug. 22, 1903. His *Essays* in two volumes were published in 1905.

Bibliography. S. H. Jeyes, *The Life and Times of . . . the Marquis of Salisbury* (4 vols., London, 1895–96); H. Whates, *The Third Salisbury Administration* (ib., 1900); F. D. How, *The Marquis of Salisbury* (ib., 1902); Justin McCarthy, in *British Political Portraits* (New York, 1903); G. R. Dennis, *The Cecil Family* (Boston, 1914); G. G. Butler, *The Tory Tradition* (London, 1914).

SALISBURY, Robert Cecil, first Earl of. See Cecil.

SALISBURY, Rollin D. (1858–1922). An American geologist and educator, born at Spring

Prairie, Wis. In 1881 he graduated from Beloit College, where he was professor of geology for several years. After a year at the University of Wisconsin he was called in 1892 to the chair of geographic geology at the University of Chicago. Here he became dean of the Ogden School of Science in 1899 and head of the department of geography in 1903. From 1882 to 1894 he served also as assistant United States geologist and thereafter as geologist. His special field was the Pleistocene geology of New Jersey. Salisbury is author of *The Physical Geography of New Jersey* (1898); *Physiography* (1907); *Elementary Physiography* (1910); *The Elements of Geography* (1912); *Modern Geography for High Schools* (1913). With T. C. Chamberlin he published *Geology* (3 vols., 1907–09) and *Introductory Geology* (1914).

SA'LISH. A North American tribe. See FLATHEAD.

SA'LISHAN STOCK. An important linguistic group whose tribes, with many dialectic variations, held nearly all the southern half of British Columbia, with the opposite coast of Vancouver Island, together with nearly all of northern and western Washington and northwestern Montana and Idaho, besides one or two detached tribes along the Oregon coast. They may be classed roughly in two groups—the fishing tribes of the coast and Puget Sound region and the root and berry gatherers of the interior. Their primitive characteristics were of a very low order. They had no agriculture, and there could hardly be said to have been any form of government. The houses were usually large communal dwellings of split cedar boards. Among the coast tribes the dead were usually laid away in canoes set upon posts in the woods, and slaves were sacrificed near the spot, being sometimes bound and left thus to starve to death. There was constant petty warfare among the various small bands, the weapons being clubs and bows, with protective body armor of toughened hide or strips of wood. Scalping was not practiced, but the slain were frequently beheaded, and the head carried home as a trophy. Head flattening was common among nearly all the tribes, particularly near the coast, as was also the curious custom of potlatch (q.v.). All the dialects are exceptionally harsh and difficult in pronunciation, and but little study has yet been made of them. The Chinook jargon (q.v.) was also in use as a regular trading medium. The majority of the tribes now retain but few of their aboriginal characteristics. Of the 80 or more tribal divisions the best known are the Bellacoola, Chehalis (Humptulip, Satsop, Georgetown), Clallam, Cœur d'Alène, Columbia (Sinkinse), Colville (Senijextee), Comox, Corvichan, Cowlitz, Dwamish, Flathead (Salish), Kalispel (Pend d'Oreilles), Lillooet, Lummi, Methow, Muckleshoot, Nespelim, Nisqualli, Nooksak, Okinagan, Pisquow, Puyallup, Quinaielt, Sanpoil, Shuswop, Skagit, Skokomish, Snohomish, Snoqualmu, Songish, Spokan, Squaxon, Suquamish, Swinomish, Tillamook, Thompson, Twana. Their present number in the United States is 7833, and probably an equal number in Canada. Consult A. B. Lewis, *Tribes of the Columbia Valley and the Coast of Washington and Oregon* (Lancaster, Pa., 1906), and C. Hill-Tout, "The Far West, the Home of the Salish and Déné," in *The Native Races of the British Empire: North America* (London, 1907).

SALIS-SEEWIS, zä'lïs-zā'vïs, JOHANN GAUDENZ, BARON VON (1762–1834). A Swiss poet, born at Seewis, Grisons. In 1779 he went to Paris and entered the Swiss Guards, in which he advanced rapidly. He returned to Switzerland in 1793, settled in Chur, married the Berenice of his poems, and took a prominent part in Swiss politics, becoming leader of the patriots and inspector general of their forces. In 1817 he retired to his estate at Malans. His poems were first published in 1793 and a twelfth enlarged edition appeared in 1839. With Matthisson he represents the sentimental nature poets, but ranks as less sentimental, more individual, and more objective than his colleague. His "Silent Land," in Longfellow's translation, is well known to English readers. Consult G. W. Röder, *Der Dichter Johann Gaudenz von Salis-Seewis* (Saint-Gall, 1863), and Adolf Frey, *Von Salis-Seewis* (Frauenfeld, 1889).

SALIVAN, sä'lē-van. A linguistic stock of Venezuela. The Salivas are found on the rivers Meta and Vichada, near the boundary of Colombia. Consult Tavera-Acosta, *En el Sur* (Ciudad Bolívar, 1907); A. F. Chamberlain, in *Journal de la Société des Americanistes de Paris,* N. S., vol. vi (Paris, 1910); R. R. Schuller, in *Anthropos,* vol. vii (Salzburg, 1912).

SAL'IVARY GLAND (Lat. *salivarius,* relating to saliva, from *saliva,* spittle; connected with Gk. σίαλον, *sialon,* Russ. *slina,* Gael. *seile,* spittle). A gland which discharges certain secretions into the mouth, where, when mixed with the mucus secreted by the mucous membrane, they constitute saliva. There are three pairs of salivary glands. The *parotid gland* is the largest. It lies upon the side of the face immediately in front of the external ear and weighs from half an ounce to an ounce. Its duct (Stenson's) is about 2½ inches in length and opens into the mouth by a small orifice opposite the second molar tooth of the upper jaw. The walls of the duct are dense and somewhat thick and the calibre is about that of a crow quill. (For structure, see GLAND.) The *submaxillary gland* is situated below the jawbone and is placed at nearly equal distances from the parotid and sublingual glands. Its duct is about 2 inches in length and opens by a narrow orifice on the top of a papilla, at the side of the frænum of the tongue. The *sublingual gland* lies under the tongue. It has a number of excretory ducts, which open separately into the mouth.

True salivary glands exist in all mammals except the Cetaceæ, in birds and reptiles (including amphibians), but not in fishes; and glands discharging a similar function occur in insects, many mollusks, etc. In insects and vertebrates this fluid is chiefly diastatic in character, changing starch to sugar. In mollusks an œsophageal gland, called salivary, secretes an acid fluid, which, like the hydrochloric acid of the vertebrate stomach, is chiefly antiseptic in its function. Certain special glands pour their secretions into the buccal cavity, such as the spinning glands of caterpillars and the glands of the swifts (q.v.) that supply the material for their nests. For the chemical and physical characters of the saliva, see DIGESTION.

The most common disease of the parotid is the specific inflammation commonly known as mumps (q.v.). These glands may also become acutely inflamed during some of the infectious diseases (e.g., scarlet fever, smallpox, or typhoid), and in these cases they readily go on to

suppuration. Many of the tumors develop in this site, some of them malignant. At times a salivary duct becomes occluded by a calculus and a troublesome fistula follows unless it is promptly removed. Increase of secretion, deficiency of secretion, or an acid or fetid change present annoying complications in different diseases. See SALIVATION.

SAL'IVA'TION (Lat. *salivatio*, from *salivare*, to spit, from *saliva*, spittle), or PTYALISM. An excessive secretion of saliva, due to irritation of the salivary glands and usually attended with inflammation of the mucous membranes of the mouth and throat and commonly induced by mercury or its compounds in excessive and long-continued doses. Other drugs, notably pilocarpine, potassium iodide, muscarine, cantharides, copper, gold, and tobacco, may produce it. Certain diseases also are provocative of an increased salivary flow, among which may be mentioned parotitis, quinsy, hydrophobia, scurvy, hysteria, stomatitis, trigeminal neuralgia, and dental irritations, including the process of dentition itself. It is an occasional phenomenon of pregnancy and menstruation. Apparent salivation may occur in facial paralysis, diphtheritic paralysis, chronic bulbar palsy, and idiocy; this is due rather to an inability to retain the secretion than to overproduction. When due to mercury salivation is manifested by a metallic taste, a foul-smelling breath, and tenderness on pressure of the gums, jaws, and teeth. The gums and tongue are red and swollen, the latter coated heavily and showing the imprint of the teeth. In severe cases the gums may bleed and ulcerate, the teeth become loosened, and the cheeks and mouth become gangrenous. Pain, sleeplessness, fever, and constitutional depression may be extreme. For the treatment of mercurial salivation, see MERCURY; SYPHILIS.

SA'LIX. The genus which includes the willows and is associated with *Populus* (poplar, cottonwood, aspen) to form the family Salicaceæ. About 200 species are recognized, of wide geographical distribution, mostly through the North Temperate and Arctic regions.

SALLE, sål, JEAN BAPTISTE DE LA. See LA SALLE.

SALLEE, så-lē', or **SLA.** A seaport of Morocco, situated at the mouth of the Bu Regreb, opposite Rabat. It is noted for its fine carpets. The chief export is wool. Sallee was formerly notorious as the haunt of pirates. Pop., about 10,000.

SALLOW. A popular name for various species of willow.

SAL'LUST (GAIUS SALLUSTIUS CRISPUS) (86–34 B.C.). A Roman historian, born at Amiternum in the Sabine country. Though a plebeian he rose to distinction, as quæstor, about 59 B.C., and as tribune of the people in 52, when he joined the popular party against Milo (q.v.), who in that year had killed Clodius (q.v.). His reputation for morality was never high, and his intrigue with Milo's wife is assigned as the cause of his expulsion in 50 from the Senate, although his attachment to Cæsar's party is a more plausible reason. In the Civil War he joined Cæsar; in 47, when Cæsar's fortune was in the ascendant, he was made prætor elect, and was consequently restored to his former rank as Senator. In Campania, at the head of some of Cæsar's troops, who were about to be transported to Africa, he nearly lost his life in a mutiny. In 46, however, we find him engaged in Cæsar's African campaign, at the close of which he was left as Governor of Numidia. His administration was sullied by acts of oppression, particularly by his enriching himself at the expense of the people. His immense fortune, so accumulated, enabled him to retire from the prevailing civil commotion into private life and devote his remaining years to the writing of history. His histories, which seem to have been begun only after his return from Numidia, are the *Catilina*, or *Bellum Catilinarium*, descriptive of the conspiracy of Catiline (q.v.), and the *Jugurtha*, or *Bellum Jugurthinum*, describing the war between the Romans and Jugurtha (q.v.). These, the only genuine works of Sallust which have reached us entire, are of great but unequal merit. The quasi-philosophical reflections which are prefixed to them, in which he discusses the causes of Roman degeneracy (the growth of immorality and the feebleness of the aristocracy and the Senate), are of no great value, but the histories themselves are powerful and animated and contain effective speeches of his own composition which he puts into the mouths of his chief characters. Its literary excellence is the main value of the *Jugurtha*, as in military, geographical, and even chronological details it is very inexact. Of Sallust's lost work, *Historiarum Libri Quinque*, only fragments exist. Sallust has the merit of having been the first Roman who wrote what we now understand by history; his works are in sharp contrast to those of the Annalists. (See ANNALS.) Good editions of the complete text of Sallust's works are by Eussner (Leipzig, 1893), Jordan (Berlin, 1887), and Dietsch (Leipzig, 1884); and of the *Catiline* and the *Jugurtha* by Capes (Oxford, 1884). The most accessible translations are those of Watson (New York, 1859), Mongan (1864), and Pollard (1882). Consult Henry Nettleship, *Lectures and Essays* (2d series, 1895), and Martin Schanz, *Geschichte der römischen Litteratur*, vol. i, part ii (3d ed., Munich, 1909). See also SALLUST, GARDENS OF.

SALLUST, GARDENS OF. The beautiful gardens laid out by Sallust (q.v.) on the Quirinal (q.v.) Hill, the Horti Sallustiani, the favorite residence of several Roman emperors, who adorned them with magnificent works of art. The gardens survived until recently where the Villa Massimi stood. Consult S. B. Platner, *The Topography and Monuments of Ancient Rome* (2d ed., Boston, 1911).

SAL'LY PORT. In fortification, usually a cutting made through the glacis by which a sally may be made from the covered way. The term has also been applied to the postern leading from under the rampart into the ditch. The sally port was an important feature of all the old castles and fortified buildings of Europe. See FORTIFICATION.

SAL'MACIS. See HALICARNASSUS; HERMAPHRODITUS.

SALMASIUS, săl-mā'shĭ-ŭs, CLAUDIUS, the Latinized form of CLAUDE DE SAUMAISE (1588–1653). A French classical scholar, born at Sémur-en-Auxois, France. He was made professor at Leyden (1631), but, in part because of the sensation caused by his *Defensio Regia pro Carolo I* (1649) and Milton's rejoinder, he accepted an invitation from Queen Christina to Stockholm (1650), whence he returned in 1651 with shattered health to Leyden. Salmasius

had great learning, which made him a literary dictator of his time and won him calls to classical chairs at Padua, Oxford, and Bologna. He is remembered for his discovery (1606) of the Greek *Anthology* of Cephalas at Heidelberg (see ANTHOLOGY, *Greek Anthology*), for an edition (1620) of the *Augusta Historia* (after Isaac Casaubon) of Florus, which he finished in 10 days, and for *Plinianæ Exercitationes in Solinum* (1629), *De Lingua Hellenistica* (1643), *De Usuris* (1638), and *De Re Militari Romanorum* (1657). Salmasius' *Life and Letters* appeared at Leyden (1656). Consult: Papillon, *Bibliothèque des auteurs de Bourgogne* (Dijon, 1745), containing an exhaustive list of Salmasius' writings; Creuzer, *Opuscula Selecta*, vol. ii (Leipzig, 1854); G. Masson, *Life of Milton*, vol. iv (London, 1858–79); J. E. Sandys, *A History of Classical Scholarship*, vol. ii (Cambridge, 1908); H. T. Peck, *A History of Classical Philology* (New York, 1911).

SALMON, săm'ŭn (OF., Fr. *saumon*, from Lat. *salmo*, salmon, leaper, from *salire*, Gk. ἅλλεσθαι, *hallesthai*, to leap). A large fish (*Salmo salar*) of the northern oceans, ascending rivers annually to spawn. The name "salmon" is also used for other more or less closely related species, and it gives the name to a family, the Salmonidæ, to which salmon, trout, whitefish, and various related forms of fishes belong. Although a small family, comprising less than 100 species, this group stands first in popular interest from almost every point of view. The following are the chief external characters of the salmon family: body oblong or moderately elongate, covered with cycloid scales of varying size. Head naked. Mouth terminal or somewhat inferior, varying considerably among the different species, those having the mouth largest usually having also the strongest teeth. (See illustration under FISH.) Maxillary provided with a supplemental bone and forming the lateral margin of the upper jaw. Pseudobranchiæ present. Gill rakers varying with the species. Opercula complete. No barbels. Dorsal fin of moderate length, placed near the middle of the length of the body. Adipose fin well developed. Caudal fin forked. Anal fin moderate or rather long. Ventral fins nearly median in position. Pectoral fins inserted low. Lateral line present. Outline of belly rounded. Vertebræ in large number, usually about 60. Skeleton not strongly ossified. The stomach in all the Salmonidæ is siphonal, and at the pylorus are many (15 to 200) comparatively large pyloric cæca. The air bladder is large. The eggs are usually much larger than in fishes generally, and the ovaries are without special duct, the ova falling into the cavity of the abdomen before exclusion. The large size of the eggs, their lack of adhesiveness, and the readiness with which they may be impregnated render the Salmonidæ peculiarly adapted for artificial culture.

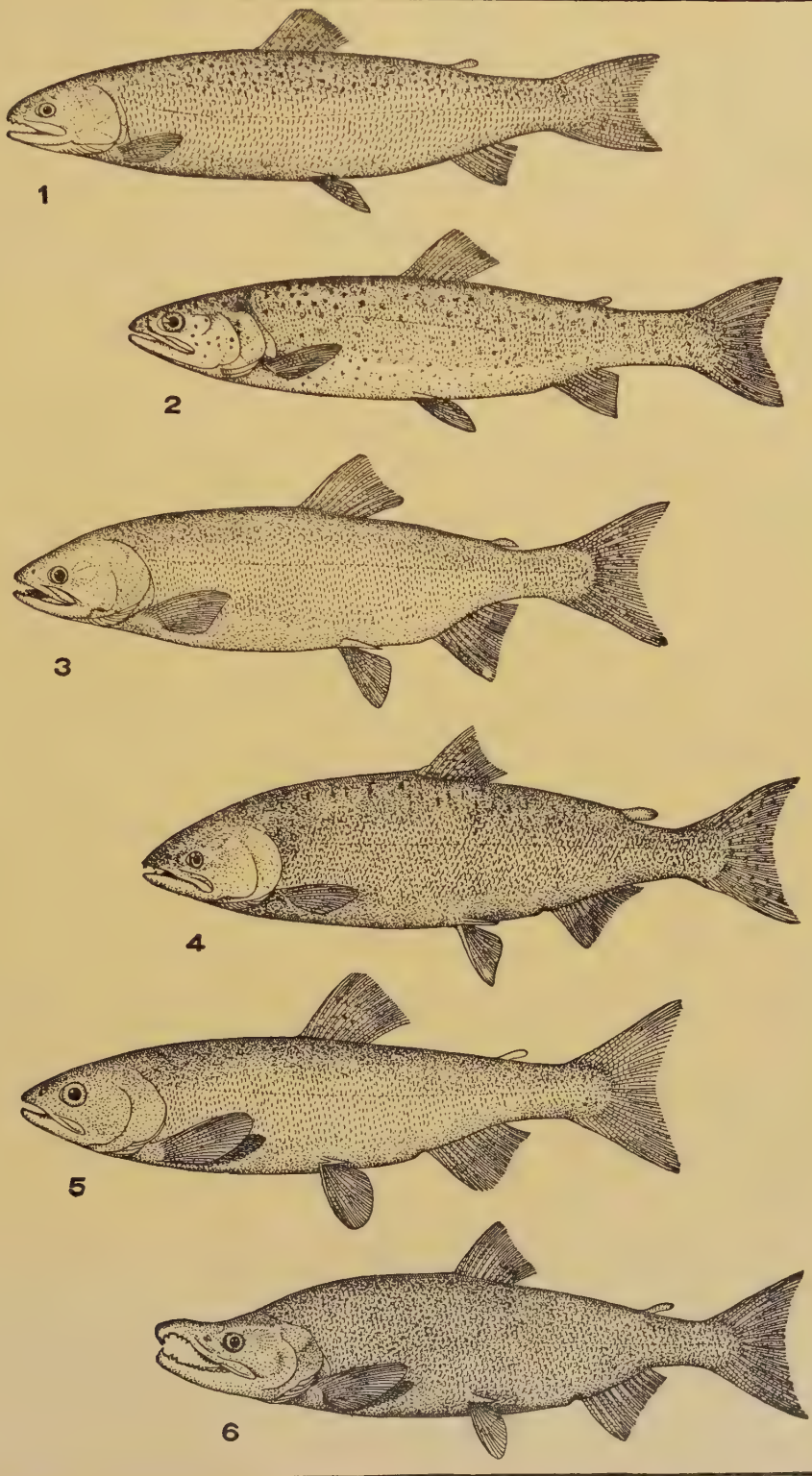
The Salmonidæ belong to the order of Isospondyli, the most primitive and least specialized of the orders of Teleostei, or bony fishes. In their group these fishes represent a high degree of development, adaptation to swift rivers and the need of complex instincts. The Salmonidæ are peculiar to the North Temperate and Arctic regions, and within this range they are almost equally abundant wherever suitable waters occur. Some of the species, especially the larger ones, are marine and anadromous, living and growing in the sea and ascending fresh waters to spawn. Still others live in running brooks, entering lakes or the sea when occasion serves, but not habitually doing so. Still others are lake fishes, approaching the shore or entering brooks in the spawning season, at other times retiring to waters of considerable depth. Some of them are active, voracious, and gamy, while others are comparatively defenseless and will not take the hook. They are divisible into 10 easily recognized genera—*Coregonus*, *Argyrosomus*, *Plecoglossus*, *Brachymystax*, *Stenodus*, *Hucho*, *Oncorhynchus*, *Salmo*, *Cristivomer*, and *Salvelinus*.

The Atlantic salmon (*Salmo salar*) is the only black-spotted salmonoid found on the Atlantic seaboard of America. (For illustration, see Colored Plate of AMERICAN FOOD FISHES, accompanying article FISH AS FOOD.) In Europe, where black-spotted trout (*Salmo fario*) and salmon trout (*Salmo trutta*) also occur, the true salmon may be distinguished by the fact that the teeth on the shaft of the vomer mostly disappear with age. From the only other species (*Salmo trutta*) positively known which shares this character, the salmon may be known by the presence of but 11 scales between the adipose fin and the lateral line.

The salmon of the Atlantic is, as already stated, an anadromous fish, spending most of its life in the sea and entering the streams in the fall for the purpose of reproduction. The time of running varies much in different streams and also in different countries. As with the Pacific species these salmon are not easily discouraged in their progress, leaping cascades 10 to 12 feet in height and other obstructions, or, if these prove impassable, dying after repeated fruitless attempts. The young salmon, or parr, is hatched in the spring. It usually remains about two years in the rivers, descending at about the third spring to the sea, when it is known as smolt. The dusky cross shades found in the young salmon, or parr, are characteristic of the young of nearly all the Salmonidæ. In the sea it grows much more rapidly, becomes more silvery in color, and is known as grilse. The grilse rapidly develop into the adult salmon, and some of them, as is the case with the grilse of the Pacific salmon, are capable of reproduction. After spawning the salmon are very lean and unwholesome, in appearance as in fact, and are then known as kelts. The Atlantic salmon does not ascend rivers to any such distances as those traversed by the quinnat and the blueback; its kelts for the most part survive the act of spawning. As a food fish the Atlantic salmon is similar to the quinnat salmon, although less oily. The average weight of the adult is probably less than 15 pounds. The largest one recorded was taken on the coast of Ireland in 1881 and weighed 84¾ pounds.

The salmon is found in Europe between lat. 45° and 75°. In the United States it is now rarely seen south of Cape Cod, although formerly the Hudson and numerous other rivers were salmon streams. The landlocked forms of salmon, abundant in Norway, Sweden, Maine, and Quebec, which cannot, or at least do not, descend to the sea, should probably not be considered as distinct species. Comparison has been made of numerous specimens of the common landlocked salmon (*Salmo salar*, var. *sebago*) from the lakes of Maine and New

SALMON AND TROUT (WESTERN)



1. SALMON-TROUT or STEELHEAD (Salmo Gairdneri).
2. COLUMBIA RIVER TROUT (Salmo mykiss, var. Clarkii).
3. HUMPBACK SALMON (Oncorhynchus gorbuscha).
4. QUINNAT SALMON (Oncorhynchus tschawytscha)
5. BLUEBACK SALMON (Oncorhynchus nerka); female.
6. BLUEBACK; old male in breeding dress.

Brunswick with landlocked salmon (*Salmo salar*, var. *hardini*) from the lakes of Sweden and with numerous migratory salmon, both from America and Europe. While showing minor distinctions, especially in size and habit, they are structurally identical. The differences are not greater than would be expected on the hypothesis of recent adaptation of the salmon to lake life.

The numerous other species of the genus *Salmo* are usually known as trout, although, except for the better development of the vomer and greater backward extension of the series of teeth upon it, there is no technical character of any importance to distinguish the Atlantic salmon from the true or black-spotted trout. But the salmon reaches a larger size than any of these and it is regularly anadromous. On the other hand, the running of trout up the rivers to spawn is irregular, and most individuals are landlocked, as are also certain dwarf varieties of the salmon (as the Sebago salmon and the ouananiche of St. John River, Quebec).

Most trout, however, enter the sea when they can. These sea-run individuals often grow large and look like salmon, and, like the salmon, they enter the rivers to spawn. They do not, however, ascend the streams with as much energy, nor do they go as far, the instinct in these respects being much less perfect. To the large species entering the sea, intermediate in structure between trout and salmon, the name salmon trout is applied in England. The species so named (*Salmo trutta*) is considered by some as doubtfully distinct from the ordinary brown trout of Europe (*Salmo fario*). Other species which may be properly called salmon trout, having the size, appearance, and habits of *Salmo trutta*, are the steelhead of California and Oregon (*Salmo gairdneri*), the kawamasu of Japan (*Salmo perryi*), and the mykiss of Kamchatka (*Salmo mykiss*). These differ in no important respect from ordinary black-spotted trout, and the young in the rivers are known as trout. Indeed, it is not certain that the various species of trout are not originally landlocked salmon trout, and it is probable that a change of environment of relatively few years might transform the one into the other. This remark does not apply to the red-spotted forms known as char in England and as brook trout or speckled trout in America. These belong to a distinct genus, *Salvelinus*. See TROUT.

The salmon of the Pacific diverge considerably from the Atlantic salmon and still more from the forms called trout. The six known species of these fishes are placed in a distinct genus, *Oncorhynchus*, and which agrees with *Salmo* in general characters and in the structure of its vomer but differs anatomically in the increased number of anal rays, branchiostegals, pyloric cæca, and gill rakers. The species of *Oncorhynchus* differ, further, in their highly specialized reproductive instincts, all individuals, male and female, dying after spawning. The character most convenient for distinguishing *Oncorhynchus*, young or old, from all the species of Salmo is the number of developed rays in the anal fin. These in *Oncorhynchus* are 13 to 20, in *Salmo* 9 to 12.

The species of *Oncorhynchus*, anadromous salmon confined to the North Pacific, was first made known in 1768 by that most exact of early observers, Steller, who described and distinguished them with perfect accuracy under their Russian vernacular names. These Russian names were in 1792 adopted by Walbaum as specific names in a scientific nomenclature; and the six species of Pacific salmon may be called: (1) quinnat, Chinook, or king salmon (*Oncorhynchus tschawytscha*); (2) red salmon, blueback, or sukkegh (*Oncorhynchus nerka*); (3) silver salmon or coho (*Oncorhynchus kisutch*); (4) dog salmon, calico salmon, or haiko, the saké of Japan (*Oncorhynchus keta*); (5) humpback or pink salmon (*Oncorhynchus gorbuscha*); (6) masu (*Oncorhynchus masou*) of Japan. These species, in all their varied conditions, may usually be distinguished by the characters given below.

The quinnat salmon (*Oncorhynchus tschawytscha*) has an average weight of 22 pounds, but individuals weighing 70 to 100 pounds are occasionally taken. It has about 16 anal rays, 15 to 19 branchiostegals, 23 (9 + 14) gill rakers on the anterior gill arch, and 140 to 185 pyloric cæca. The scales are comparatively large, there being from 130 to 155 in a longitudinal series. In the spring the body is silvery, the back, dorsal fin, and caudal fin having more or less of round black spots and the sides of the head having a peculiar tin-colored metallic lustre. In the fall the color is often black or dirty red, and the species can then be distinguished from the dog salmon only by its technical characters.

The blueblack salmon (*Oncorhynchus nerka*) usually weighs from five to eight pounds. It has about 14 developed anal rays, 14 branchiostegals, and 75 to 95 pyloric cæca. The gill rakers are more numerous than in any other salmon, usually about 39 (16 + 23). The scales are larger, there being 130 to 140 in the lateral line. In the spring the form is plumply rounded and the color is a clear bright blue above, silvery below, and everywhere immaculate. Young fishes often show a few round black spots, which disappear when they enter the sea. Fall specimens in the lakes are bright red in color, hook-nosed and slab-sided, and bear little resemblance to the spring run. Young spawning male grilse are also peculiar in appearance and were for a time considered as forming a distinct genus. This species appears to be sometimes landlocked in mountain lakes, in which case it reaches but a small size and is called koko by the Indians.

The silver salmon (*Oncorhynchus kisutch*) reaches a weight of three to eight pounds. It is silvery in spring, greenish above, and with a few faint black spots on the upper parts only. In the fall the males are mostly of a dirty red. The dog salmon (*Oncorhynchus keta*) reaches an average weight of about nine pounds. In spring it is dirty silvery, immaculate, or sprinkled with small black specks, the fins dusky. In the fall the male is brick red or blackish, and its jaws are greatly distorted. The humpback salmon (*Oncorhynchus gorbuscha*) is the smallest of the species, weighing from three to six pounds. Its scales are much smaller than in any other salmon. In color it is bluish above, the posterior and upper parts with many round black spots. The masu (*Oncorhynchus masou*) is thus far known only from the rivers of northern Japan. It is much like the humpback salmon, but may be known at sight by the absence of black spots on its tail.

The blueback abounds in Fraser River and in all the streams of Alaska; the silver salmon in

Puget Sound; the quinnat in the Columbia and the Sacramento; and the dog salmon in some of the streams to the northward and especially in Japan. All of the five American species have been seen in the Columbia and Fraser rivers, all but the blueback in the Sacramento, and all in waters tributary to Puget Sound. Only the quinnat has been noticed south of San Francisco, as far as Carmelo River. The king salmon and blueback habitually run in the spring, the others in the fall. The usual order of running in the rivers is as follows: *tschawytscha, nerka, kisutch, gorbuscha, keta.* The economic value of the spring-running salmon is far greater than that of the other species, because they can be captured in numbers when at their best, while the others are usually taken only after deterioration. To this fact the worthlessness of *Oncorhynchus keta,* as compared with the other species, is partly due. Its flesh at the best, however, is soft and mushy.

The habits of the salmon in the ocean are not easily studied. King salmon and silver salmon of all sizes are taken with the seine at almost any season in Puget Sound; this would indicate that these species do not go far from the shore. The king salmon takes the hook freely in Monterey Bay, both near the shore and at a distance of 6 to 8 miles out. We have reason to believe that these two species do not necessarily seek great depths, but probably remain not very far from the mouth of the rivers in which they were spawned. The blueback and the dog salmon probably seek deeper water, as the former is seldom taken with the seine in the ocean and the latter is known to enter the Strait of Juan de Fuca at the spawning season, coming in from the open sea. The run of the king salmon begins generally at the last of March; it lasts, with various modifications and interruptions, until the actual spawning season, August to November, the time of running and the proportionate amount in each of the subordinate runs varying with each different river. In the Sacramento the run is greatest in the fall, and greater in the summer than in spring. The spring salmon ascend only those rivers which are fed by the melting snows from the mountains and which have sufficient volume to send their waters well out to sea. Those salmon which run in the spring are chiefly adults (supposed to be mostly four years old). It would appear that the contact with cold fresh water, when in the ocean, in some way causes them to run towards it and to run before there is any special influence to that end exerted by the development of the organs of generation. High water on any of these rivers in the spring is always followed by an increased run of salmon. The manner of spawning is probably similar for all the species. Usually the fishes pair off; the male, with tail and snout, excavates a broad, shallow nest in the gravelly bed of the stream, in rapid water, at a depth of 1 to 4 feet; the female deposits her eggs in it, and after the exclusion of the milt the pair cover them with stones and gravel. They then float down the stream tail foremost, never swimming down stream or making any effort to reach the sea. In the course of from a day to a week or two all of them, both males and females, die, regardless of the distance of their spawning beds from the sea. The young hatch in from 120 to 180 days.

The salmon of all kinds in the spring are silvery, and the mouth is about equally symmetrical in both sexes. As the spawning season approaches the female loses her silvery color, becomes more slimy, the scales on the back partly sink into the skin, and the flesh changes from salmon red and becomes variously paler from the loss of oil, the degree of paleness varying much with individuals and with inhabitants of different rivers. In the Sacramento the flesh of the quinnat, in either spring or fall, is rarely pale. In the Columbia a few with pale flesh are sometimes taken in spring and a good many in the fall. In Fraser River the fall run of the quinnat is nearly worthless for canning purposes, because so many are white-meated. In the spring very few are white-meated, but the number increases towards fall, when there is every variation, some having red streaks running through them, others being red towards the head and pale towards the tail. The red and the pale ones cannot be distinguished externally, and the color is dependent upon neither age nor sex. There is not much difference in the taste, but there is no market for pale-fleshed salmon.

As the season advances the difference between the males and females becomes more and more marked and keeps pace with the development of the milt, as is shown by dissection. The males have (1) the premaxillaries and the tip of the lower jaw more and more prolonged, both of the jaws becoming finally strongly and often extravagantly hooked, so that either they shut by the side of each other like shears or else the mouth cannot be closed. (2) The front teeth become very long and canine-like, their growth proceeding very rapidly, until they are often ½ inch long. (3) The teeth on the vomer and tongue often disappear. (4) The body grows more compressed and deeper at the shoulders, so that a very distinct hump is formed; this is more developed in the humpback and dog salmon, but is found in all. (5) The scales disappear, especially on the back, by the growth of spongy skin. (6) The color changes from silvery to various shades of black and red, or blotchy, according to the species. The distorted males are commonly considered worthless and are rejected by the canners and salters, but are preserved by the Indians. These changes are due solely to influences connected with the growth of the reproductive organs. They are not in any way due to the action of fresh water. They take place at about the same time in the adult males of all species, whether in the ocean or in the rivers. At the time of the spring runs all are symmetrical. In the fall all males, of whatever species, are more or less distorted.

As already stated the economic value of any species depends in great part on its being a spring salmon. It is not generally possible to capture salmon of any species in large numbers until they approach the rivers, and the spring salmon enter the rivers long before the growth of the organs of reproduction has reduced the richness of the flesh. The fall salmon cannot be taken in quantity until their flesh has deteriorated; hence the dog salmon is practically almost worthless except to the Indians, and the humpback is little better. The silver salmon, with the same breeding habits as the dog salmon, is more valuable, as it is found in the inland waters of Puget Sound for a considerable

time before the fall rains cause the fall runs, and it may be taken in large numbers with seines before the season for entering the rivers. The quinnat or Chinook salmon, from its great size and abundance, is more valuable than all the other fishes on the Pacific coast of the United States outside of Alaska taken together. The blueback, a little inferior in flesh, much smaller, and far more abundant when Alaska is considered, is worth more than the combined value of the three remaining species of salmon.

The fall salmon of all species, but especially of the dog, ascend streams but a short distance before spawning. They seem to be in great anxiety to find fresh water, and many of them work their way up little brooks only a few inches deep, where they perish miserably, floundering about on the stones. It is the prevailing impression that the salmon have some special instinct which leads them to return to spawn on the grounds where they were originally hatched, but there is no evidence of this. It seems more probable that the young salmon hatched in any river mostly remain in the ocean within a radius of 20 to 100 miles of its mouth. These, in their movements about in the ocean, may come into contact with the cold waters of their parent river, or perhaps of any other river, at a considerable distance from the shore. In the case of the quinnat and the blueback their instinct seems to lead them to ascend these fresh waters, and in a majority of cases these waters will be those in which the fishes in question were originally spawned. Later in the season the growth of the reproductive organs leads them to approach the shore and search for fresh waters, and still the chances are that they may find the original stream. But undoubtedly many fall salmon ascend, or try to ascend, streams in which no salmon were ever hatched.

Commercially speaking the two principal species of Pacific salmon are unquestionably the most valuable fishes in the world. The market value of the entire salmon catch on the west coast of the United States, including Alaska, has reached nearly $20,000,000 annually, and this vast amount is represented chiefly by the two species, the Chinook and the blueback, the catch of the four other species being in comparison insignificant. The annual catch of salmon in Puget Sound has reached more than $4,000,000, and consist chiefly, as in Alaska, of bluebacks. The run of quinnats begins in the Columbia River as early as February or March. At first the fishes travel leisurely, moving up only a few miles each day. As they go farther and farther up stream they swim rather more rapidly. Those that enter the river first are the ones which will go farthest towards the headwaters, many of them going to spawning beds in the Salmon River in the Sawtooth Mountains of Idaho, more than 1000 miles from the sea. In the Yukon the quinnat ascends to Caribou Crossing, 2250 miles from the sea. Those which go to the headwaters of the Salmon River in the Sawtooth Mountains spawn in August and early September; those going to the Big Sandy in Oregon, in July and early August; those going up the Snake River to Upper Salmon Falls, in October; while those entering the small lower tributaries of the Columbia or the small coastal streams spawn even as late as December. Observations made at various places indicate that whatever the spawning beds may be, spawning will not begin until the temperature of the water has fallen to 54° F. If the fish reach the spawning grounds when the temperature is above 54°, they wait until the water cools down to the required degree. The spawning act extends over several days.

It has been often stated and generally believed that the salmon receive many injuries by striking against rocks and in other ways while en route to their spawning grounds and as a result of these injuries those which go long distances from the sea die after once spawning. An examination of many salmon at the time of arrival on their spawning beds in central Idaho showed most fishes to be entirely without mutilations of any kind and apparently in excellent condition. Mutilations, however, soon appeared, resulting from abrasions received on the spawning beds while pushing the gravel about or rubbing against it and from fighting with each other. See illustration under Dog Salmon.

The blueback salmon is found from the coast of southern Oregon northward, especially in the Columbia, Quinialt, and Skagit rivers. It enters the Fraser in enormous numbers, and is by far the most abundant and valuable salmon in Alaska. In the Columbia River it is called blueback; in the Fraser it is the sockeye, sawkeye, or sauqui; in Alaska it is the red salmon or redfish; while among the Russians it is the krasnaya ryba.

The death of all the individuals of all the species of the west coast salmon after once spawning is in no manner determined by distance from the sea. The cause is deep-seated in its nature and general in its application and is the same as that which compasses the death of the ephemera or May fly after an existence of but a few hours or of all annual plants at the end of one season.

See Char; Fisheries; Trout; Whitefish; and certain specific names, as Cisco, Namaycush, etc.; also Colored Plate of Food Fishes; Plate of Salmon and Trout.

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SALMON, Daniel Elmer (1850–1914). An American veterinarian, born at Mount Olive, N. J. He carried on veterinary studies at Cornell and in Paris, taking the degree of D.V.M. at Cornell in 1872. From 1879 to 1884 he was an investigator for the United States Department of Agriculture, and thenceforth until 1906 served as chief of the Bureau of Animal Husbandry, which he had organized.

To the credit of the bureau during this period are important achievements relative to the shipment, inspection, and treatment of cattle and the suppression of contagious cattle diseases. Dr. Salmon himself also carried on significant investigations. In 1907–12 he had charge of the veterinary department in the University of Montevideo, Uruguay. He served as president of the United States Veterinary Medical Association in 1898. His scientific papers and official reports are numerous.

SALMON, GEORGE (1819–1904). An Irish mathematician and divine, born in Dublin. He was educated at Trinity College in that city, where he became a fellow at the age of 20. He took orders and in 1866 became professor of theology. He wrote extensively on theology, his works including an *Introduction to the Study of the New Testament* (7th ed., 1894); *Nonmiraculous Christianity* (2d ed., 1888); *The Infallibility of the Church* (2d ed., 1891). But he is best known for his masterly treatises on mathematics, his textbooks being the most advanced that appeared in English in his generation. These works are: *Treatise on Conic Sections* (6th ed., 1879); *Treatise on Higher Plane Curves* (3d ed., 1879); *Treatise on Analytic Geometry* (1848); *Treatise on Analytic Geometry of Three Dimensions* (4th ed., 1882); *Lessons Introductory to the Modern Higher Algebra* (1859; 4th ed., 1885). These mathematical works have been translated into several languages, and the German editions of Fiedler are especially well known.

SALMON, SIR NOWELL (1835–1912). An English admiral. He was educated at Marlborough, entered the navy in 1847, and in 1856 became a lieutenant on the *Shannon*. He served with the celebrated *Shannon* Brigade, which took part in the relief of Lucknow at the time of the Indian Mutiny, and for his bravery was decorated and promoted to commander. In 1879 he became rear admiral and in 1882–85 was commander in chief at the Cape of Good Hope. In the latter year he was promoted to vice admiral and two years later was made K.C.B. He was commander in chief in China from 1888 to 1891, when he became full admiral. In 1889 he was raised to the rank of admiral of the fleet, and in 1905 retired from active service.

SALMON DANCE. A dance of the Karok, Yurok, and Tolowa tribes of American Indians, held in the spring when the salmon begin to run up the rivers. No man may catch a salmon before the dance nor for 10 days afterward, even in case of extreme necessity.

SALMONETE, säl'mō-nā'tā. See GOATFISH.

SALMO'NEUS (Lat., from Gk. Σαλμωνεύς). A king of Elis who, wishing to be thought a god, sought to imitate Jove's thunder by driving his chariot over a brazen bridge, and the lightning by torches hurled in all directions. For this he was killed by lightning.

SALMON FISHING. This sport demands the exercise of all the skill and judgment which the experienced angler may possess. No arbitrary rule can be laid down in the selection of a rod, as much will depend upon the skill, strength, and experience of the fisherman; usually a 17-foot rod is considered long enough for ordinary casting. A moderately thick line will be required if a powerful rod is employed. A *leader* must be selected according as the water is clouded or clear, a finer line being selected for the clearer water. It is in the selection of flies that the greatest differences of opinion exist regarding salmon fishing. The consensus of opinion seems to be that the question of color is more important than that of pattern. Consult Cholmondeley-Pennell, *Fishing*, in the Badminton Library (London, 1885). See FLY CASTING; FISHING.

SALMON KILLER. See STICKLEBACK.

SALMON RIVER. A stream of Idaho. It rises in the Salmon River Mountains, in the south-central part of the State, flows northward, westward, again northward, and then southward to its confluence with the Snake River, 50 miles above Lewiston (Map: Idaho, C 4). It is about 400 miles long, and throughout its length it flows in a deep, cañon-like valley, whose steeply sloping sides rise from 3000 to 4000 feet above it.

SALMON TROUT. See SALMON.

SALM-SALM, zälm'zälm', FELIX, PRINCE (1828–70). A German soldier of fortune, born at Anhalt. He was educated at the cadet school near Berlin and, after serving in the Prussian and Austrian armies, came to the United States in 1861. At the beginning of the Civil War he was appointed to the staff of Gen. Louis Blenker and later was commissioned colonel of the Eighth New York Volunteers, a German regiment. In 1864 he was appointed to the command of the Sixty-eighth New York Volunteers and the next year was made brigadier general and served as post commander at Atlanta. At the end of the war he went to Mexico, where he became one of the Emperor Maximilian's aids and chief of his household. Soon after Maximilian's execution he returned to Europe, reëntered the Prussian service as major in the Grenadier Guards, and was killed at Gravelotte. He published an account of his experiences in *My Diary in Mexico, Including the Last Days of Emperor Maximilian* (1868). Consult Princess Salm-Salm, *Ten Years of my Life* (New York, 1875).

SALO, sä'lō, GASPARO DA. See VIOLIN, *School of Brescia.*

SAL'OL (from *sal-icyl* + *phen-ol*), PHENYL SALICYLATE, $C_{13}H_{10}O_3$. The salicylate of phenol, a white crystalline powder, nearly tasteless and odorless, almost insoluble in water, but soluble in alcohol, ether, and chloroform. It is very slightly or not at all dissolved in the stomach, but in the alkaline intestinal secretion is split into 36 parts of phenol and 64 of salicylic acid. This fact is utilized in testing the muscular activity of the stomach. In the healthy stomach salol should pass into the intestine and after decomposition there appear in the urine as salicyluric acid within one-half to three-quarters of an hour. The physiological effects of salol are practically the same as those of salicylic acid (q.v.), which is formed by its decomposition in the intestine, but the ringing in the ears and other cerebral symptoms are less marked and frequent, and gastric disturbance is rare on account of its insolubility in the stomach. Aside from these advantages it is inferior to sodium salicylate in the treatment of acute rheumatism. It is of value as an intestinal antiseptic. It is often combined with phenacetine to relieve the muscular and nerve pains accompanying influenza. It is contraindicated in patients having disease of the kidneys, the carbolic acid acting as an irritant and rendering the urine dark.

SALOMÉ, sä'lô'mā'. An opera by Richard Strauss (q.v.), first produced at Dresden, Dec. 9, 1905; in the United States, Jan. 22, 1907 (New York).

SALO'ME (Gk. Σαλώμη, either shortened from Heb. *sh lōmī'ēl*, my peace is God, or from Heb. *shālōm*, peace, with Gk. ending). The name of several women mentioned in later Jewish history and in the New Testament. 1. One of the rulers during the Maccabæan period of Jewish history. She was the wife of Aristobulus I, whose reign lasted but one year (103 B.C.). Upon his death she released his brother, Alexander Jannæus, from prison and gave him her hand in marriage and with it the throne. At his death in 78 B.C. she reigned as Queen until she died (69 B.C.). Unlike her husband she favored the Pharisees, and her prosperous reign was considered by them the golden period of the Maccabæan era. 2. A sister of Herod the Great, intensely jealous of her influence with her brother and the primary cause in arousing the murderous suspicions which led him to put to death all possible rivals of, or intriguers against, his power. She was an unscrupulously wicked woman. Her first husband was Joseph, Herod's uncle, from whom she was divorced; her second, Costobar, Governor of Idumæa, from whom also she was divorced; her last, a certain Alexas. 3. A daughter of Herod the Great by Elpis, his eighth wife. 4. The daughter of Herodias by her first husband, Herod Philip, and granddaughter of Herod the Great. It was her skillful dancing at the birthday banquet of Herod Antipas which induced that ruler to make the rash vow that led to the death of John the Baptist (Mark vi. 21–28). She married Philip the Tetrarch (Luke iii. 1) and afterward Aristobulus, one of the numerous descendants of Herod, ruler of Lesser Armenia. 5. One of the women present at the crucifixion (Mark xv. 40) and afterward at the sepulchre (Mark xvi. 1). From Matt. xxvii. 56 it would seem that she is to be identified with the mother of Zebedee's children (cf. Matt. xx. 20–23). On the basis of a comparison of Mark xv. 40 with John xix. 25, scholars claim that she was sister to Mary, the mother of Jesus.

SALOMON, sä'lô-mon, HAYM (1740–85). An American patriot, born at Lissa, Poland, descended from Portuguese-Hebrew stock. He came to America in 1772 and on the outbreak of the Revolution was identified with the cause of American Independence. In 1776 he was imprisoned by the British on a charge of espionage and, although a prisoner, succeeded in stirring up dissension among Hessian officers. In 1778 he escaped to Philadelphia, where he became an agent of Robert Morris (q.v.) and succeeded in obtaining large subsidies from Holland and France for the conduct of the American War. He loaned Morris about $600,000 of his own money for the patriot cause, and at the time of his death $400,000 of this had not been returned. In addition he supplied funds to Jefferson, Madison, Randolph, and other patriot leaders. Many prominent American Hebrews in 1915 urged the founding of a national university in his memory, expending therefor part of the accumulated interest on the debt still owed to Salomon. Consult M. C. Peters, *Haym Salomon, the Financier of the Revolution* (New York, 1911).

SALOMON BEN GABIROL, sä'lô-mōn' bĕn gä'bē-rol'. See AVICEBRÓN.

SALOMON ISLANDS. See SOLOMON ISLANDS.

SALOMONS, sä'lô-monz, SIR DAVID (1797–1873). An English merchant and writer. Born in London of Jewish parents, he early engaged in commerce and was one of the founders of the London and Westminster Bank in 1832. The corporation of London having been advised that a Jew could hold the office on taking an oath which bound his conscience, Salomons was elected in 1835 a sheriff for London and Middlesex, his election being afterward confirmed by a special act of Parliament. The same year he was chosen alderman, but refused the position on account of the oath he was required to take. He was subsequently chosen for various other offices, but on his second election as alderman the objectionable oath, being sustained on appeal when legally tested, kept him from accepting the position and induced him to procure the passage of a law in 1845 which opened municipal offices to Jews. He was accordingly admitted alderman of Cordwainer ward, London, and in 1855 was elected Lord Mayor of the city. Returned in 1851 as Liberal member for Greenwich in the House of Commons, he refused to take the oath, but nevertheless voted and was fined. In 1858 the parliamentary oath was changed, mainly through the efforts of Lord John (afterward Earl) Russell (q.v.), Gladstone, and Lionel Nathan de Rothschild (see ROTHSCHILD), and Salomons sat in the House of Commons for Greenwich from 1859 until his death. He was an authority on commercial and financial questions. In 1869 he was made Baronet. His publications include: *A Defense of Joint-Stock Banks* (1837); *The Monetary Difficulties of America* (1837); *An Account of the Persecution of the Jews at Damascus* (1840); *Parliamentary Oaths* (1850); *Alteration of Oaths* (1853).

SALON, sä'lôN'. A town of the Department of Bouches-du-Rhône, France, 20 miles northwest of Aix (Map: France, S., K 5). The fourteenth-century church of St. Lawrence contains the tomb of the astrologer Nostradamus. Near by, at Lançon, is a Roman camp in good preservation. Olive oil and soap are manufactured and there is also a trade in almonds. The town suffered severely in the earthquake of 1909. Pop., 1901, 12,872; 1911, 14,019.

SALON (Fr., drawing room). A room devoted to the reception of company and hence a periodic reunion for conversational and social purposes. Such reunions have been very common in Paris and have had a marked influence not only upon literature and manners but also upon politics. The first salon proper was that of the Hôtel de Rambouillet (q.v.). Immediately after the cessation of political turmoil Madame de Scudéry (q.v.) began her famous Saturday evenings in the Rue de Beauce, which were attended by Conrat, Ménage, Balzac, Madame de la Suze, and Madame de Sévigné, but were looked down upon by the nobility. The real successor of the Marquise de Rambouillet was Madame de Sablé, who at her salon succeeded in bringing together the aristocracy of intellect and that of birth. Salons now began to multiply, and the system flourished until the middle of the nineteenth century and, indeed, continued in modified forms to the present. In the seventeenth century, besides those already mentioned, the salons of Ninon de l'Enclos and Madame Scarron (afterward De Maintenon)

were specially famous; in the eighteenth, those of Madame du Deffand, of Madame de Lespinasse, of Madame Geofrin, of Madame de Turpin, of Madame Necker, and of Madame Roland; and in the nineteenth those of Madame de Staël, of Madame Récamier, of Madame Vigée le Brun, of Madame de Girardin, and of Madame Mohl were among the most conspicuous. There were salons which were distinctively political, or literary, or philosophic, but the greater number aimed rather at an eclecticism which afforded meeting places for all sorts of talents and all shades of belief or unbelief.

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SALON, The Paris. The title by which the annual exhibition of paintings, sculpture, engravings, etchings, pastels, and water colors is known and which is held in the Palais de l'Industrie, Paris, from May 1 to June 22. The exhibition is open to living artists of whatever nationality, subject to their works meeting with the acceptance of the jury of experts elected by the votes of the exhibitors themselves. Those who have received the requisite number of medals or other recompenses at previous exhibitions are placed *hors concours* and their works are exempt from examination by the jury. The prizes, consisting of various medals and the Prix de Rome (q.v.), are within the gift of the same jury and are the object of eager competition. Annual exhibitions by members of the Royal Academy were first held at the Palais Royal in 1667, and in 1669 they were transferred to the Salon Carré of the Louvre, whence they obtained their name. The Revolution abolished the special privileges of the members of the Royal Academy and in 1791 opened the doors of the Salon to all French artists. In 1855 the Salon for the first time was held at its present quarters in the Palais de l'Industrie. Previous to 1872 the Salon was in charge of the artist members of the Institute, but the preponderance of architects among them led the government, in 1872, to put it in charge of the exhibitors themselves, organized as the Société des Artistes Français. Dissensions consequent upon the awards at the Exposition of 1889 resulted in the formation of the Société Nationale des Beaux-Arts, which holds an independent exhibition in the Champs de Mars from May 15 to July 15 each year. The Paris Salon is the precursor of the similar exhibitions in London and elsewhere. Many publications besides the official catalogues treat both salons, like the fine folio series published by Goupil et Cie. (Paris, 1880–1908) and the sumptuous reproductions issued yearly by Braun et Cie. They are noticed in all important art periodicals treating contemporary art, especially well in the *Gazette des Beaux-Arts*.

SALO'NA. Now a village in Dalmatia, near Spalato (q.v.); formerly an important city of the Roman Empire. It figures in the Roman wars with Illyria as early as 119 B.C. It sided with Cæsar against Pompey. It was especially prosperous from about 300 A.D. onward. Diocletian (q.v.) was born in Salona and retired to it after his abdication. It was destroyed by the Goths in 535. Many remains of the Roman occupation have been brought to light in recent years. Consult A. L. Frothingham, *Roman Cities in Italy and Dalmatia* (New York, 1910).

SALONIKI, sä'lô-nē'kē, or Salonica (Turk. *Selanik*). Formerly the capital of a vilayet of the same name and an important seaport of the Balkans; incorporated in the Hellenic Kingdom under the Treaty of Bucharest, Aug. 10, 1913. It is situated at the northern end of an inlet of the Gulf of Saloniki, about 140 miles south of Sofia (Map: Greece, E 3). It lies partly on the flat coast of the inlet and partly on the slopes of Mount Kissos. It is still partly surrounded by white walls and is commanded by the citadel of Heptapyrgion, or Seven Towers. Saloniki, abounding in well-preserved monuments of antiquity, is of great archæological interest. The triumphal arch across the former Via Egnatia (Grande Rue de Vardar) is variously ascribed to Constantine and Theodosius. The other arch, attributed to Vespasian, was demolished in 1867. The portico with caryatides, known as Las Incantadas, is believed to be the entrance to a hippodrome. The walls of the city along the water have been demolished and replaced by a magnificent quay, at the eastern end of which is the White Tower or the Tower of Blood, a remnant of the ancient fortifications.

The mosques of Saloniki are mostly of Byzantine origin and are characterized by great splendor. The mosque of St. Sophia (probably sixth century) is modeled after the famous mosque of the same name in Constantinople and is crowned by a vast dome with beautiful mosaics. The Rotunda (probably fourth century), the former church of St. George, also deserves especial mention for its mosaics. St. Demetrius (not later than sixth century) is interesting for the originality of its interior arrangement.

The principal manufactures are morocco leather and leather products, cutlery and arms, flour, cotton yarn, bricks and tiles, and soap. By its situation Saloniki is remarkably well adapted for a great commercial seaport. The new harbor opened in 1901, 28 feet deep, is protected by a breakwater 1835 feet long and has a quay over 1475 feet long, which was widened to 306 feet in 1903–07 and at each end has a pier 656 feet long projecting into the sea. The chief exports of Saloniki are grain, animals, and animal products, silk cocoons, wool, tobacco, opium, manganese, etc. The chief imports are textiles, sugar, coffee, flour, tobacco, chemicals, and iron goods. The large foreign trade is chiefly with Great Britain and Austria-Hungary.

Pop. (est.), 1913, 160,000, consisting chiefly of Sephardic Jews, Greeks, and Mohammedans. The language of the Sephardim, Ladino, is spoken to a considerable extent by the other races.

Saloniki is the ancient Thessalonica (q.v.). Throughout nearly the whole of the Middle Ages it belonged to the Byzantine Empire. It was in the hands of the Turks from 1430 until Nov. 8, 1912, when, in the course of the Balkan War (q.v.), it surrendered to a Greek army. It was in the streets of Saloniki that King George I of Greece was assassinated (March 18, 1913). In 1915 it was used as a landing place for troops of France and Great Britain in order

to oppose the German advance. The allies strongly fortified their positions and the men who took part in the unsuccessful Dardanelles campaign were transferred here. See WAR IN EUROPE.

SA'LOP. A colloquial name for the English county of Shropshire (q.v.).

SAL'PA (Lat., from Gk. *σάλπη, salpē*, sort of stockfish). A barrel-shaped ascidian existing either as small, separate individuals or forming a colony or chain consisting of large individuals. Salpa is pelagic, one species occurring in abundance off the shores of southern New England, while the others live mostly on the high seas all over the tropical and subtropical regions of the globe. The hermaphroditic aggregated or chain salpa differs from the solitary asexual form in being less regularly barrel-shaped and without the two long posterior appendages of the latter. Salpa reproduces parthenogenetically, as in some crustaceans and insects, exhibiting a true case of alternation of generations (q.v.) of the kind called metagenesis. Consult W. K. Brooks, "Memoir on the Genus Salpa," in *Memoirs of the Biological Laboratory of Johns Hopkins University*, vol. ii (Baltimore, 1893), an exhaustive treatise.

SALPÊTRIÈRE, sål'på'trè'âr'. A home and hospital for aged women in Paris. Begun by Louis XIV in 1656 upon the site of the Petit Arsenal, the Saltpêtrière has been added to continually, until to-day the 45 buildings which cover its grounds accommodate over 5000 people —probably the largest institution of its kind in Europe. A large part of its population are superannuated female employees of the government and there are a very large number of insane women. The hospital was used as a prison during the French Revolution.

SAL PRUNELLE'. See SALTPETRE.

SALSETTE'. An island a mile distant from the west coast of British India, situated immediately north of Bombay, with which it is connected by a causeway (Map: India, B 5). The area is about 241 square miles. It is chiefly notable for the hundred or more remarkable Buddhist caves found at Kenery in the middle of the island, excavated in the face of a single hill and containing elaborate carvings, especially representations of Buddha, many of them of colossal size. Two railroads run across the island, which has a population of nearly 150,000.

SALSIFY, săl'sĭ-fĭ (Fr. *salcifis*, dialectic *sercifi*, OF. *sercifi, cerchefi*, from It. *sassafrica*, goatsbeard, from Lat. *saxum*, rock + *fricare*, to rub), OYSTER PLANT, OR VEGETABLE OYSTER (*Tragopogon porrifolius*). A biennial plant of the family Compositæ, indigenous to the Mediterranean region and cultivated in Europe, America, and Australia for its edible spindle-shaped root, 8 to 12 inches long and about an inch in diameter at the top. It requires a deep, rich soil and is cultivated like parsnips, like which it may be left in the ground during the winter. In the second season it produces many-branched flower stalks 3 or 4 feet high, bearing terminal heads of purplish flowers. A yellow-flowered variety of salsify (*Tragopogon pratensis*) is a weed both in Europe and America. See Plate of ONIONS, OYSTER PLANT, ETC.

SALT (AS. *sealt*, Goth. *salt*, OHG. *salz*, Ger. *Salz*, salt; connected with Lat. *sal*. Gk. *ἅλς, hals*, salt). The chloride of sodium, known mineralogically as halite (q.v.), containing 60.41 per cent of chlorine and 39.50 per cent of sodium. Salt may occur under several different conditions as follows: 1. As an ingredient of all ocean water and also in that of most inland lakes or seas having no outlet. 2. As natural brines, sometimes found in the porous layers of rocks and representing either sea water imprisoned in the layers of sediment since their formation or else derived from the solution of rock salt by underground waters. 3. As a crust or layer on or in swamps and old lake bottoms, not uncommon in arid regions. 4. As rock salt or massive salt, occurring as beds, lenses, or dome-shaped masses in sedimentary rocks such as shales or sandstones.

The origin of salt has occasioned much controversy. It has been supposed by many to be precipitated from sea water which has evaporated to such an extent as to form a supersaturated brine. While this may readily explain thin deposits, the enormous depth of water required to produce a deposit of salt several thousand or even several hundred feet thick, makes it inapplicable in some cases at least. This difficulty is overcome to the satisfaction of some by assuming the salt to have been deposited in a more or less landlocked bay in a region of strong evaporation and periodic influx of fresh brine. The curious dome-shaped masses of rock salt are explained usually by assuming an ascending supply of brine along a fissure in which it was deposited, the force exerted by the growing crystallizing deposit doming up the surrounding rocks as we now find them.

If the evaporation of ocean water continued to dryness there might be salts of potash and magnesia deposited on the rock salt, but this is found only at Stassfurt, Prussia, and a few other places in Europe.

The impurities found in rock salt or natural brines may be gypsum, magnesium chloride, calcium chloride, and clayey impurities. The gypsum is usually separated during the evaporation of the brine. The other substances are usually present in small amounts. In Ohio calcium chloride may be saved as a by-product, and in Michigan, Ohio, and West Virginia bromine is extracted from the mother liquor left after the salt is precipitated. None of the American brines contain enough potash to warrant its extraction.

ANALYSES OF ROCK SALT FROM VARIOUS LOCALITIES

DEPOSIT	Sodium chloride	Calcium chloride	Magnesium chloride	Calcium sulphate	Alumina, silica, iron
Retsof, N. Y.	98.701	tr.	...	.446	.743
Pearl Creek, N. Y.	96.885	.157	.103	.437	1.210
Petite Anse, La.	98.900	.146	.022	.838	.014
Saltville, Va.	99.084	tr.	...	.446	.470

Distribution and Production. The occurrence of salt is widespread. In the United States the most productive deposits are found in New York, Pennsylvania, Virginia, West Virginia, Ohio, Michigan, Illinois, Kansas, Louisiana, and Texas. Important quantities of salt are won also from the waters of Great Salt Lake in Utah and from those of San Francisco Bay in California. In New York the salt is obtained from beds of the Salina series,

where it exists as lens-shaped deposits of rock salt which attain an extreme thickness of 250 feet. Since the beds outcrop in the central part of the State and dip southward, some of the more southern deposits lie at a depth of 2700 feet. The Salina formation also carries salt in Michigan at a depth of from 1600 to 2200 feet. The great source of salt in this State, however, as well as in Ohio, is the Lower Carboniferous, from which the brines sometimes have an added value owing to the presence of bromine. In West Virginia the salt occurs in the Lower Carboniferous along the Kanawha and Ohio rivers. Kansas has recently attained importance as a producer of both brine and rock salt, which is extracted from beds that lie along the contact of the Permian and Triassic systems at a depth of from 450 to 1000 feet. The extensive deposits occurring on Avery Island and the island of Petite Anse, La., are of recent geologic age.

The production of salt in the United States has increased very rapidly. The output in 1881 was 6,200,000 barrels (of 280 pounds), valued at $4,200,000; in 1891 it was 9,987,945 barrels, valued at $4,716,121; in 1905 it amounted to 25,966,122 barrels, valued at $6,095,922; while in 1914 it was 34,804,683 barrels, valued at $10,271,858. A considerable portion of the output in recent years has been converted into the various soda products. The production of the leading States in 1914 was as follows:

PRODUCTION OF SALT IN THE UNITED STATES IN 1914

LOCALITY	Barrels	Value
New York	10,389,314	$2,824,733
Michigan	11,670,976	3,299,005
Ohio	5,482,836	1,320,554
Kansas	2,967,864	924,556
California	1,100,443	856,861
Other States	3,193,250	1,045,655
Total	34,804,683	$10,271,358

In Europe the most notable deposits of salt are found in the Cheshire district of England; at Stassfurt, Brunswick, and Hanover, Germany; Wieliczka, Bochnia, and Hallstadt, Austria; Máramaros, Hungary; the Crimea and the Donetz basin, Russia; and Cardona, Spain. The mines of Wieliczka, near Cracow, are famous for their great antiquity and the unusual size of the underground workings.

Extraction Methods. The simplest method of obtaining salt is by the evaporation of sea water, but this is seldom practiced except in those countries or regions that lack subterranean brines or rock-salt deposits or cheap supplies. Rock salt is sometimes obtained by mining, but in most regions the salt is obtained from subterranean sources by wells. With these the natural brine is either drawn to the surface or else, as in the case of rock salt, water is forced down one well tube, the salt taken into solution, and the artificial brine raised to the surface. If necessary the brine may be allowed to stand to let clayey impurities settle, after which it is evaporated sufficiently to precipitate gypsum, and later in other containers to precipitate the salt. The evaporation processes employed at the present time are as follows: (1) solar evaporation; (2) direct-heat evaporation, (*a*) in open kettles, (*b*) in open pans; (3) steam evaporation, (*a*) in jacketed kettles, (*b*) in grainers; (4) vacuum-pan evaporation. Numbers (2) *a* and (3) *a* are little used now.

Uses. Salt is used extensively in the meat-packing business and the manufacture of dairy products, as also for domestic purposes. Many different grades are called for which are known under different names, such as table, dairy, common, fine, packer's, solar, rock, milling, etc. Much salt is also consumed in the manufacture of soda ash, sodium carbonate, caustic soda, etc.

Salt has been used to some extent as a fertilizer. It belongs to the class of soil improvers. (See MANURES.) Since it supplies no essential element of plant food, its value as a soil improver is probably due to its physical action (attraction for water, etc.), or its ability to set free inert plant food in the soil.

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SALT, OIL OF. See BITTERN.

SALT, SIR TITUS (1803–76). An English manufacturer, born at Morley in the West Riding of Yorkshire. He learned the wool-stapling business and in 1824 entered into partnership with his father at Bradford. He was the first to make practical use of the Donskoi Russian wool in worsted manufacture, and in 1836 he introduced alpaca to the British market. In 1853 he opened a great factory a few miles from Bradford, on the river Aire, about which there soon grew up the town of Saltaire. His factories were built with special regard to warmth, light, and ventilation, and in the town he erected hundreds of model dwellings, a public dining hall, factory schools, public baths, and other conveniences. He was created Baronet in 1869. Consult James Burnley, *Sir Titus Salt* (London, 1885).

SALTA, säl'tä. A province of northwest Argentina (Map: Argentina, F 2). Area, 48,301 square miles. The western half is occupied by Andean ranges, while the eastern part belongs to the Gran Chaco. The climate is hot in the eastern plains and temperate in the west. The province is abundantly watered and contains a considerable area of agricultural land. Grain, sugar cane, tobacco, coffee, and various

kinds of fruit are raised successfully. The mountains contain gold, silver, copper, and other minerals, but the principal occupations of the inhabitants are agriculture and cattle raising. Pop. (est.), 1913, 157,720. Capital, Salta (q.v.).

SALTA. The capital of the Province of Salta, Argentina, situated among the mountains, 135 miles northwest of Tucumán (Map: Argentina, F 2). The town is well built, with paved streets, and has a cathedral, a national college, and a normal school. It is connected with Buenos Aires by rail, and a line into Bolivia is under construction (1915). Its importance is due to increasing trade with Bolivia. Pop. (est.), 1912, 40,000.

SALTAIR. See SALT LAKE CITY.

SALTAIRE. See SALT, SIR TITUS.

SALTBUSH. See ATRIPLEX.

SALT CAKE. A name applied to the crude sodium sulphate obtained when sodium chloride is treated with sulphuric acid. See SODA.

SALTILLO, säl-tēl'yō; *colloq.* -tē'yō, or LEONA VICARIO. The capital of the State of Coahuila, Mexico, situated on the plateau 5200 feet above sea level and 45 miles southwest of Monterey, on the National Railways of Mexico (Map: Mexico, J 5). It is regularly laid out and has a handsome church, a college, and athenæum, and the Madero Institute, containing a library. The chief industries are the manufacture of cotton and woolen fabrics, knitted goods, and flour. The town is an important trade centre. Pop., 1910, 35,414. Near the city is Buena Vista, the scene of a battle between the Mexican and the United States forces in 1847.

SALTIRE, săl'tēr. One of the ordinaries in heraldry (q.v.), drawn in the form of St. Andrew's cross.

SALT LAKE CITY. The capital of Utah and the county seat of Salt Lake County, near the Jordan River, 12 miles southeast of Great Salt Lake and 676 miles west by north of Denver (Map: Utah, C 2). The Salt Lake and Los Angeles, the Denver and Rio Grande, the Oregon Short Line, the Western Pacific, the Salt Lake and Utah, and the Salt Lake Route railroads enter the city. Salt Lake City holds a unique place among the towns of the United States as the headquarters of the Latter-Day Saints, generally known as Mormons (q.v.). It is situated in a spacious valley, more than 4300 feet above the sea and surrounded by mountains. To the east is Fort Douglas (q.v.), a United States government military post, with an extensive reservation. There are hot sulphur springs in the vicinity and on the shores of Great Salt Lake (q.v.) there has existed since the year 1893 the extensive bathing resort known as Saltair. The city has an area of about 51 square miles. It is laid out on a grand scale, the streets being broad and regular and pleasantly shaded. Irrigation ditches line the thoroughfares. Lawns and gardens add to the general attractiveness. Several of the wards contain public squares. Liberty Park has an area of 110 acres.

Near the centre of the city is the Temple Block (square), containing the temple, the tabernacle, and the assembly hall—all together forming the official seat of the Mormon church. The temple, the most beautiful of the imposing edifices erected by the Mormons, was begun in 1853 and was finished in 1893 at an estimated cost of $4,000,000. The structure is of granite, 186 by 99 feet, and each end is surmounted by three lofty towers. The highest spire supports a figure of the angel Moroni. The tabernacle is an elliptical building, 250 by 150 feet, having a roof similar in shape to a turtle shell. It is noted for one of the largest self-supporting arches in the world and for its great organ. Its acoustic properties are superb. The auditorium seats 8000 persons, while as many as 12,000 have attended services at times. Among other buildings connected with the Mormon church are the former residences of Brigham Young, the Lion House, the Beehive House, the new administration building, and also the large establishment of Zion's Coöperative Mercantile Institution, whose annual sales are said to amount to more than $6,000,000. Among the features of the city are the Brigham Young and the seagull monuments. The new State capitol, occupying beautiful grounds and erected at a cost of $2,500,000, was completed in 1915. The city and county building, costing $900,000, and the Federal building, costing a like sum, are noteworthy; other prominent structures are the Salt Lake Theatre, the State Penitentiary, and Holy Cross, Deseret, and St. Mark's hospitals, two fine hotels, several tall office buildings, and the Union and the Denver and Rio Grande stations. The University of Utah (q.v.) is in Salt Lake City, also a State normal school. The private institutions for secondary education include All Hallow College (Roman Catholic), Gordon Academy (Congregational), the Latter-Day Saints' University, Rowland Hall (Protestant Episcopal), and the Salt Lake Collegiate Institute (Presbyterian). There are several libraries, of which the most important, aside from those belonging to the educational institutions, are the Public, with some 64,000 volumes, and the State Law Library.

Salt Lake City is the most important town between Denver and the Pacific coast. Its interests are mainly commercial, the city being the distributing centre for a vast and rich mining, stock-raising, and farming country. The productiveness of the region is secured by means of irrigation and dry farming. The city is the headquarters of several large mining companies and has smelters and mineral mills. Almost 10,000,000 tons of ore are smelted annually in the vicinity. Salt Lake City has, in recent years, achieved considerable importance as a manufacturing centre. The value of its products increased from $7,544,000 in 1905 to $35,000,000 in 1914; more than $25,000,000 worth of raw materials were used in the latter year and employment given to 8000 persons. Among the leading establishments are car shops, breweries, confectionery factories, boot and shoe factories, foundries and machine shops, lime and cement works, saddlery and harness factories, looking-glass and picture-frame factories, tobacco, cigar, and cigarette factories, lumber mills, etc. Electric power is used by many of the factories, as well as by the electric-lighting and the street-railway plants. A large part of the power is electrically developed from a mountain cataract some 35 miles from the city.

The city government is vested in a commission of five members, consisting of a mayor and four commissioners, elected every four years. The city attorney, treasurer, recorder, chief of police, etc., are appointed. The city spent in 1914 nearly $2,000,000, exclusive of schools, the prin-

cipal items being: streets and improvements, $573,000; public safety, $436,000; water-supply system, $363,000; parks and public property, $140,000; public library, $35,000; and public affairs, $46,000. The water works, built in 1874, are the property of the municipality. The system has cost nearly $7,000,000. It now comprises 285 miles of mains. The net debt of the city in 1915 was $4,648,000, the assessed valuation $68,143,339. Pop., 1860, 8236; 1870, 12,854; 1880, 20,768; 1890, 44,843; 1910, 92,777; 1915 (U. S. est.), 113,567; 1920, 118,110.

The city was founded in 1847 by the Mormons under Brigham Young, who, leaving the Missouri River in April, arrived at this point in July. It was organized as a city in 1851 and until 1868 was called Great Salt Lake City. Less than one-half of the inhabitants now are Mormons. Consult: H. H. Bancroft, *History of Utah* (San Francisco, 1889); Jones, *Salt Lake City* (Salt Lake City, 1889); L. P. Powell (ed.), *Historic Towns of the Western States* (New York, 1901); E. V. Fohlin, *Salt Lake City Past and Present* (Salt Lake City, 1909). See MORMONS.

SALTO, säl'tō. The capital of the department of the same name, Uruguay, on the left bank of the river Uruguay, 260 miles northwest of Montevideo, with which it has railway connection (Map: Uruguay, H 4). Here steamers from Montevideo and Buenos Aires transfer their cargoes for south Brazil. The chief industries are leather manufacturing, the salting of meats, and boatbuilding. Pop., 1914, 19,788. Salto was founded in 1817.

SALT OF PHOSPHORUS. See MICROCOSMIC SALT.

SALT OF TARTAR. A commercial name for crude potassium carbonate.

SALTON DESERT. See GREAT AMERICAN DESERT.

SALTON (sąl'ton) **SEA.** A temporary lake in southern California formed in 1905 and 1906 by the overflow inland of water from the Colorado River through the water channel of an irrigation canal conducting water from the Colorado River near Yuma, Ariz., to the Imperial valley region (Map: California, K 9). The Salton basin, or lower part of this valley, sometimes known as the Colorado desert, is below sea level (280 feet in its lowest part), and when the water was deflected from the natural channel of the river normally emptying into the Gulf of California, over 400 square miles were flooded and the submergence of an area of nearly 2000 square miles, involving large loss in property and natural resources, was threatened. Several unsuccessful attempts were made to turn the Colorado River back into its original channel. The overflow was finally controlled by the middle of February, 1907, by the construction by the Southern Pacific Railroad of three parallel trestles across the break, from which large stones were dumped almost simultaneously. This checked the flood and the lake gradually disappeared through evaporation. The covering and uncovering of this vast territory afforded a unique opportunity for biologists and botanists to study the floral and faunal effects under such conditions, while in addition the geography and geology were critically examined, and there is available a wealth of scientific information on this region and its phenomena. A second break occurring in 1910 caused a flow into the Paredones River, about 15 miles lower down the stream, and threatened to fill Volcano Lake and eventually flow to the north and produce considerable destruction. This break was closed in a manner similar to the closing of the earlier one and the danger averted.

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SALTONSTALL, sąl'ton-stąl, GURDON (1666–1724). A Colonial Governor of Connecticut, born at Haverhill, Mass. He graduated at Harvard in 1684 and in 1691 was ordained pastor of the First Church (Congregational), at New London, Conn. He soon became prominent in politics and was elected Governor of Connecticut in 1707, to fill the unexpired term of Governor Winthrop, and was thereafter reëlected until his death. He was instrumental in carrying out a system of ecclesiastical discipline which was embodied in the Saybrook platform (q.v.). Through his efforts a considerable body of men was raised in 1709 in the Colony for the unfortunate expedition under Sir Hovenden Walker for the conquest of Canada. The first printing press in Connecticut was set up in Saltonstall's house the same year. It was largely due to him that Yale was removed from Saybrook to New Haven.

SALT'PE'TRE (OF. *salpestre,* Fr. *salpêtre,* from Lat. *sal,* salt + *petra,* from Gk. *πέτρα,* rock), or NITRE. A mineral potassium nitrate crystallizing in the orthorhombic system. It is found native in certain soils of Spain, Egypt, and Persia, and especially in East India, although in relatively small quantities. Still smaller deposits, of local importance only, are found in various parts of the world. In the United States such deposits occur in caves in Kentucky and elsewhere in the Mississippi valley, as well as in Tennessee. Saltpetre occurs but seldom in strata, being for the most part a product continually formed by the action of nitrifying bacteria upon decomposing protein in the presence of oxygen. The process of refining consists in bringing the nitre into solution and adding potassium carbonate for the decomposition of any calcium or magnesium nitrates that may be present. The liquid is clarified by boiling with glue. After skimming the clear liquid is run off into coolers, from which the nitre separates as minute floury crystals which are finally washed to remove all adhering mother liquor. Much of the commercial saltpetre is now made from Chile saltpetre (see below) by means of potassium chloride. Potassium nitrate is readily soluble in water. When heated to about 340° C. (644° F.) it fuses without decomposition, forming a thin liquid which, cast into molds, solidifies to a white, translucent, fibrous mass known as sal prunelle. Saltpetre finds extensive use in the arts, in the manufacture of

SALT LAKE CITY

THE MORMON TABERNACLE

THE MORMON TEMPLE

gunpowder and other explosives, in the making of fireworks and matches, as a preservative for foods, as a flux in assaying, in the production of nitric acid and organic nitro compounds, as an ingredient of fertilizers, and to a small extent in medicine.

Chile saltpetre, or cubic nitre, is the mineral sodium nitrate that is found native along the western coast of South America, especially in northern Chile and Bolivia, where it occurs in beds several feet in thickness. The commercial article is prepared by lixiviation of the crude material with boiling water, concentration, and crystallization. The resulting salt contains from 92 to 97 per cent of pure sodium nitrate.

SALT RANGE, or KALABAGH. A mountain range of the Punjab, India, between the Indus and the Jhelum. It is a rugged chain of rocky and barren peaks from 2000 to 5000 feet high and is noted for immense deposits of pure rock salt.

SALTS. Compounds formed by the substitution of metals or bases for the hydrogen of acids. See ACIDS; CHEMISTRY (historical section); DISSOCIATION.

SALTS, ETHEREAL. See ESTERS.

SALTS, SMELLING. A preparation of carbonate of ammonia with some of the sweet-scented volatile oils, used as a restorative in cases of faintness.

SALT SPRING. A common term for subterranean saline waters which reach the surface through natural or artificial passages. See SALT; SPRING.

SALTUS, sal'tŭs, EDGAR (EVERTSON) (1858–1921). An American novelist and journalist, born in New York City. He received his education in St. Paul's School, Concord, N. H., and later in the Sorbonne and the universities of Munich and Heidelberg. He graduated from the Columbia Law School in 1880. His first published works were biographical and philosophical: *Balzac* (1884); *The Philosophy of Disenchantment* (1885); *The Anatomy of Negation* (1886). Later he wrote much fiction, dealing chiefly with contemporary fashionable life: *The Truth about Tristrem Varick* (1888); *Eden* (1888); *A Transaction in Hearts* (1889); *The Pace that Kills* (1889); *Love and Lore* (1890); *Mary Magdalen* (1892); *A Story without a Name* (1891); *Imperial Purple* (1892); *Madame Sapphira* (1893); *Enthralled* (1894); *When Dreams Come True* (1895); *Perfume of Eros* (1905); *Historia Amoris* (1906); *Daughters of the Rich* (1909); *The Monster* (1913). An elder brother, FRANCIS SALTUS SALTUS (1849–89), was a poet, traveler, and linguist, whose first volume, *Honey and Gall*, appeared in 1873. After his death his poems were edited in four volumes by his father.

SALT-WATER PLANTS. See HALOPHYTE.

SALTYKOV, sal'tĭ-kŏf', MIKHAIL. A Russian writer. See SHTCHEDRIN.

SALTZMANN, zälts'mân, KARL (1847–). A German marine and landscape painter, born in Berlin. He was a pupil of Herman Eschke, then studied at Düsseldorf, and, after traveling through Holland and Italy, settled in Berlin. In 1878–80 he went with Prince Henry of Prussia on his trip around the world and later accompanied the German Emperor on his visit to St. Petersburg and Norway. Of the pictures resulting from these journeys may be mentioned "Corvette Prince Adalbert in the Strait of Magellan" (1883, Breslau Museum), "In the Pacific Ocean" (1888, German Emperor), and "Arrival of the Hohenzollern at Kronstadt" (Emperor of Russia). The National Gallery, Berlin, contains two paintings by him. In 1888 Saltzmann was awarded the great gold medal at Berlin and in 1896 he was appointed professor at the Academy.

SA'LUS. The Roman goddess of health, corresponding to the Greek Hygeia (q.v.). She had a temple on the Quirinal Hill, dating from 307 B.C. She is represented with a rudder and globe or pouring a libation on an altar encircled by a serpent.

SALUTATI, sä'lōō-tä'tē, COLUCCIO (1331–1406). An Italian humanist, born at Stignano (Val di Nievole). He enjoyed great prestige as Chancellor of Florence, an office which he used to further the classical tradition initiated by Petrarch. His official letters set a new standard of linguistic elegance in diplomatic intercourse. He developed the scientific method of Latin text constitution used by Petrarch, whose political ideas of republican freedom he also sustained. He directed the publication of Petrarch's *Africa*. In 1392 he discovered and edited Cicero's epistles *Ad Familiares*. Among his writings were biographies of Boccaccio, Petrarch, and Dante and a translation into Latin of part of the *Divina Commedia*. Consult: F. Novati, *La giovinezza di C. Salutati* (Turin, 1888), and id., *Epistolario di C. S.* (4 vols., Rome, 1892–1905).

SAL'UTA'TION, ANGELIC. See AVE MARIA.

SALUTATIONS (Lat. *salutatio*, from *salutare*, to salute, from *salus*, health, prosperity, from *salvus*, safe; connected with Skt. *sarva*, whole, entire). The employment of formal and prescribed methods of address when one person encounters another. Such greetings were formerly graduated according to rank; in recent times, with increasing democracy, they have grown less and less precise. Salutations may be made either by words or gestures. With respect to the verbal formulas they may be classified under several heads. 1. The expression of a desire for the prosperity of the person accosted. This depended originally on the belief that a wish for good or evil might be effective in bringing about the state of things desired and produce a corresponding effect on the individual towards whom it was directed. We have a simple example in the expression "Your health!" used in drinking. 2. The offering of a prayer for the well-being of any one, which is continued in our "good morning," "good night," which are abbreviations for "God give you good morning," etc. 3. Expressions of gratitude, admiration, or honor. Here belongs the "plural of majesty," applied first to kings and by degrees made general.

Terms of respect like "your Honor," "your Majesty," "your Grace," "your Excellency," have been appropriated to particular degrees of rank. It is only a more ancient variety of the preceding use when an idea of adoration is introduced of which a survival is seen in the title of Reverend applied to clergymen. Gestures may be regarded as arising in the first place from the animal impulses, as in the pleasure of contact which induces patting the cheek or hand, embracing, and the like. The manifestation of such enjoyment exhibits much variation; thus, kissing is by no means a universal human practice, but is rather confined to certain peoples, its place being taken by such customs as nose rubbing, which occurs among the Maori of New Zealand and other tribes. There are likewise attitudes

of subservience, implying that the inferior puts himself at the disposal of the superior. Here belong our customs of bowing and curtsying, of lifting the hand in salute, and the kneeling and prostration still practiced in the Orient. Denudation is a movement symbolic of resignation of one's goods to a ruler, and survives perhaps in the customs of lifting the hat or removing the glove before shaking hands.

SALUTE'. The compliment paid by the military or naval services of a nation to the ruler or representative of another nation; also a military courtesy rendered by noncommissioned officers and men to commissioned officers, who are required by regulation to acknowledge such courtesy by returning the salute. Similar courtesies are required between commissioned officers, the junior saluting first. Salutes of this character are not required nor authorized between the different grades of enlisted men. In certain cases, as at guard mounting, the subordinate private or noncommissioned officer in reporting his subdivision to a noncommissioned officer is required to precede such report with the prescribed salute. Such salute is not a courtesy, but part of the report. Enlisted men unarmed salute with the hand farthest from the officer. Officers are always saluted whether in uniform or not. An enlisted man unarmed, when covered, salutes with the hand before addressing an officer, and again after receiving a reply. If uncovered he stands at attention without saluting. The same custom obtains in the English army. Soldiers in the United States regular army are required to salute, in the prescribed form, officers of the navy, marines, volunteers, and militia, just as they would their own officers. When the national or regimental color standard uncased is carried past a guard or other armed body, the salute is given and the field music sounds "to the color." Officers and men armed salute in the manner prescribed for such arm; if unarmed they salute with the hand, if covered.

Salutes with Cannon are fired between sunrise and sunset only, Sundays usually excepted. In the United States the national flag is displayed when a salute is fired. The salute of 21 guns is accorded to the President or an ex-President on his arrival at and departure from a military post or naval vessel, no other personal salute being allowed in his presence. The number of guns prescribed for other officials is as follows: the Vice President, Ambassador, President of the Senate, or members of the cabinet, 19; Chief Justice, Governor-General, Governor of State or Territory or island, speaker of the House of Representatives, committee of Congress, admiral, or general, 17; Assistant Secretary of War or of the Navy, Envoy Extraordinary, vice admiral, or lieutenant general, 15; Minister resident, rear admiral, or major general, 13; chargé d'affaires or brigadier general, 11.

In the navy salutes are of various kinds. A junior or inferior salutes a senior or superior by touching his cap. Other salutes are firing of guns, manning of yards, dipping of colors, etc. Men in boats salute by lying on their oars or tossing them. In the United States and in most other services small-calibre guns are used for saluting. When a man-of-war fires a salute to a foreign flag or a foreign officer, the salute is returned gun for gun; but if the salute is to an officer of the same service, the latter only returns the number of guns to which the junior is entitled by his rank. The salute by dipping of colors is made by a man-of-war only in answer to a similar salute made by a merchant vessel. The flag of a military post is never dipped by way of salute or compliment, but is half-masted as part of the funeral honors paid the military or naval dead. As few modern men-of-war have yards, manning the yards is no longer a common usage.

SALUZZO, sȧ-lo͞o'tsō. A city in the Province of Cuneo, Italy, at the foot of the Alps, near the Po, 18 miles by rail north-northwest of Cuneo (Map: Italy, A 2). It has a Gothic cathedral, begun in 1491, and many other ancient buildings. The manufactures are silk fabrics, leather goods, ironware, and hats. The chief trade is in grain, wine, and cattle. The Marquisate of Saluzzo, created in the first half of the twelfth century, lasted till 1548, when the city was seized by the French, who gave it up to Savoy in 1601. Pop. (town), 1911, 10,321.

SALVADOR, săl'vȧ-dōr'. The smallest and most densely populated Republic of Central America (Map: Central America, C 4). Its area is 7225 square miles.

Topography. Along the north border extends the great Sierra Madre of Central America, with many peaks ranging from 6000 to 8000 feet, culminating in that of Cacaguatique. Parallel with this and about 30 miles to the south extends a lower range, or rather elevated table-land, marked by clusters of volcanic peaks, of which Izalco (q.v.) is the most noted. There are deposits of gold, silver, copper, and lead in the eastern part of the Republic, iron in the western, and coal in the Lempa valley, but only gold and silver mines are worked. Between the main ranges is a table-land diversified by short mountain spurs and drained largely by the Lempa, the chief river of the Republic, and the San Miguel. This lofty valley constitutes its most fertile, most healthful, and most populous portion. Between the second range and the coast lies a series of plains broken by short rocky spurs that occasionally reach the shore. These plains are for the most part marshy and unhealthful during the rainy season. In addition to the rivers mentioned the La Paz and Goascorán are of interest in connection with the boundaries of Guatemala and of Honduras. The lakes are almost wholly of volcanic origin; Guija, belonging partly to Guatemala, and Ilopango are the most notable. The principal harbor, La Unión Bay, an arm of the Gulf of Fonseca, is the best in Central America. Earthquakes and volcanic eruptions are common. Hot and cold mineral springs are found in all parts of the country.

Climate. The lower areas below 2000 feet, designated as hot lands, are torrid and generally subject to fevers. Lying between 2000 and 5000 feet are the temperate lands, enjoying an even and delightful climate. The rainfall is somewhat less than in adjacent states, but sufficient, the rainy season lasting from May to October.

In general Salvador resembles the rest of Central America in its vegetable and animal life. Among its special flora may be mentioned the hoitziloxitl, whose product is known as Peruvian balsam; the pita, whose fibre is used for thread, cordage, and cloth; and the yucca, utilized for the manufacture of starch. A moderate supply of cabinet and building timber exists, and many important medicinal and dye plants are annu-

ally exported. Native rubber trees abound, but wasteful methods are employed in extracting the product.

Agriculture. The mountain valleys and tablelands are deeply covered by an alluvial soil which renders this section the richest agricultural region of Central America. By far the most important crop is coffee, which is grown everywhere in the Republic between the altitudes of 1500 and 4000 feet and covers about 125,000 acres. The estimated crop for the year 1913–14 was 65,000,000 pounds, of which 57,514,000 pounds were exported. A fine quality of indigo, sugar, tobacco, rice of the dry, upland variety, a little cacao, and beans, corn, potatoes, vegetables, and fruits for local use, constitute the chief agricultural products. The cultivation of cotton is being encouraged by a government export bounty. About 2,000,000 rubber trees have been planted. Balsam of Peru is an important product. There is excellent pasturage, and the breeds of cattle have been greatly improved.

Manufactures. Aside from the simple household industries the manufactures of Salvador are not important. There are, however, sugar refineries and distilleries, whose products are largely for home consumption, saw mills, starch factories, cordage works, and mills for cleaning coffee.

Commerce. Imports and exports were valued in 1909 at $4,177,000 and $6,361,000 respectively, and in 1913 at $6,174,000 and $9,929,000. Cotton goods constitute by far the largest class of imports. The other principal imports are hardware and machinery, drugs and medicines, flour, and boots and shoes. Values of the chief exports, in thousands of dollars, in 1913: coffee, clean, 7810; coffee in parchment, 97; gold in bars, 581; gold and silver amalgams, concentrates, etc., 974; silver in bars, 22; sugar and panela, 171; indigo, 56; cattle hides, 94. In thousands of dollars imports from and exports to the United States in 1913, 2491 and 2824; United Kingdom, 1604 and 706; Germany, 714 and 1700; France, 418 and 2030; Italy, 225 and 1208.

Transportation and Communication. There are upward of 200 miles of narrow-gauge railway. A line connects the port of Acajutla with San Salvador (65 miles); a branch extends to Santa Ana (25 miles). San Salvador is also connected with Santa Tecla and La Libertad. In the east a line extends from the port of La Unión to San Miguel (40 miles) and thence to a point beyond Usulután (over 40 miles). Steamship lines connect the ports of the Republic with those of the United States, Europe, and South America. The length of telegraph wire in 1914 was about 2500 miles.

Government. Salvador has a centralized republican government under a constitution last revised in 1886. The executive power is vested in a President, elected by popular vote for four years and assisted by a responsible cabinet of four ministers. The legislative branch consists of a single chamber, the National Assembly, composed of three members from each of the 14 departments, elected annually. The judicial power is vested in a supreme court at the capital and in several district courts with local municipal justices. Each of the 14 departments is in charge of a Governor, appointed by the national executive. The alcaldes and other municipal officers are elected by popular vote.

Finance. The monetary unit is the silver peso; the coin contains 0.723379 ounce of fine silver and its value fluctuates with the price of that metal. The peso was worth about 46 cents in 1901, 35 in 1903, 51 in 1907, 44.5 in 1912, and 42.2 in 1913. Attempts to introduce the gold standard in 1892 and 1897 were unsuccessful. In 1912 revenue amounted to 16,190,338 pesos and the expenditure to 15,678,370 pesos. Customs amounted to 8,324,869 pesos, exclusive of export duties of 1,400,894 pesos. Expenditure for 1914 was reported at 15,085,219 pesos. The largest disbursements are for war and the public debt. The public debt at the end of 1914 was reported at 27,893,259 pesos. There are four banks of issue, which at the end of 1913 had notes in circulation to the value of 1,570,854 pesos.

The metric system was adopted in 1885, but the old Spanish weights and measures are in common use.

Population. Salvador is one of the most densely populated countries of America. As reported in 1901 the population was 1,006,848 (493,893 males, 512,955 females); at the end of 1913, 1,225,835. Only a small proportion is white, Indians being returned at 234,648 and mestizos at 772,200. Reported population of some of the larger towns: San Salvador, the capital, 66,800; Santa Ana, 48,120; San Miguel, 24,768; Nueva San Salvador, 18,770; San Vicente, 17,832; Sonsonate, 17,016. Roman Catholicism is the prevailing religion. Primary instruction is free and nominally compulsory, but the majority of children do not attend school. The government is active in encouraging education. The people have achieved a considerable degree of economic development and political stability. In 1913 there were in operation 856 schools, with an enrollment of 50,550 and an average attendance of 38,121. Of the schools 711 were government schools, 7 charity, and 47 private. In addition there were 3 normal schools, 3 technical schools, 14 other schools of advanced rank, and a national university with faculties of law, science, medicine (and pharmacy and dentistry), and engineering.

Army. Service is compulsory, only in case of war, for men between 18 and 50 years of age. The active forces consist of about 80 officers, 500 noncommissioned officers, and 16,000 men; the first reserve of about 50 officers, 350 noncommissioned officers, and 11,000 men; the third reserve of 250 officers, 1750 noncommissioned officers, and 16,000 men. Total available strength, about 380 officers, 2550 noncommissioned officers, 43,000 men.

History. After the conquest of Central America by Alvarado in 1524–25 Salvador formed part of the Captaincy-General of Guatemala. When Mexico threw off the Spanish yoke in 1821 the Central American provinces accomplished the same result without bloodshed. For a time Salvador and her sister provinces formed a part of the ephemeral empire of Itúrbide. After his overthrow and until 1839 it was one of the states of the Central American Federation, but since the dissolution of this Salvador has usually opposed the successive attempts to unite Central America.

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SAL'VAGE (OF. *salvage*, from *salver, sauver*, Fr. *sauver*, to save, from Lat. *salvare*, to save, from *salvus*, safe). In maritime law, an allowance in money which is awarded by courts of admiralty to those who voluntarily save a ship or her cargo from loss by peril of the sea (when it may be called civil salvage) or recover them after capture (when it is termed military salvage). The service rendered in salving must be voluntary and not one which the person rendering it is under a legal duty to perform. The services of salvors must be rendered within the admiralty jurisdiction in order to entitle those rendering them to receive salvage, as the right to salvage is not recognized by the common law.

When the salvors are in possession they have a certain qualified property right in the ship, which does not, however, extinguish that of the owners, but gives them the right to continue the salvage service to the exclusion of other would-be salvors. Where the first set of salvors are themselves assisted by a second set, the salvage is divided according to the respective merits of the parties; but the law favors the first salvors, and only great peril of the first set or final abandonment of the vessel or cargo by them will justify interference on the part of a second.

The amount of the salvage to be paid is not fixed by any rule of law or statute, but rests within the discretion of the admiralty judge, who awards the amounts due as salvage. The following considerations, however, are of great weight in determining what amount shall be paid as salvage: (1) the dangers from which the property is salved; (2) the danger to the salvors; (3) the value of the property salved; (4) the value of the property risked by the salvors; (5) the labor, time, and skill expended by the salvors; (6) the risk run by the salvors of not saving the property and consequently of not being remunerated for their labor.

Higher salvage will be usually decreed in derelict cases than where an intention of returning to the vessel temporarily abandoned is clear. While there is no absolute law regarding the distribution of salvage, the owners of the salvor vessel receive usually one-third, the master twice as much as the mate, the mate double a seaman's share, and those who navigate the saved ship into port, or otherwise take the greater risk, double the share of those who remain on the salvor vessel. A claim to salvage may be barred by a contract, not extortionate or unconscionable, to pay a fixed sum for the aid to be given. In such case the rights of the parties are determined by the contract and not by the maritime law of salvage, and the salvors may recover for services rendered whether they are successful or not. Another bar is the existence of a custom of rendering assistance among vessels of the same class, as in the steamboat navigation of the Mississippi. Salvage adjustments are made and enforced in England by the Court of Admiralty and in the United States by the United States district courts. Salvors have a lien on the property salved, which takes precedence over all others and may be enforced in admiralty by a proceeding in rem, or the salvors may at their option proceed against the owner of the property salved by a proceeding in personam. See Admiralty; Derelict; Lien; Maritime Law; Prize.

SALVANDY, säl'vän'dē', Narcisse Achille, Count de (1795–1856). A French statesman and historical writer, born in Condom (Gers). He took part in the campaigns of 1813 and 1814 and subsequently in the *Journal des Débats* attacked the reactionary policy of the government. He was Minister of Public Instruction in 1837–39 and 1845–48 and Ambassador to Madrid from 1841 to 1843 and to Turin from 1843 to 1845. In addition to his political and other fugitive writings, he published the novel *Don Alonzo, ou l'Espagne* (1824); *Histoire de Pologne avant et sous le roi Jean Sobiesky* (1827–29); *Seize mois, ou La révolution et les révolutionnaires* (1831); and other works.

SALVARSAN, säl'vär-săn (from Low Lat. *salvare*, to save + Lat. *sanitas*, health); Arsenobenzol; "606." A synthetic arsenic compound discovered by Ehrlich and Hata in 1907 and looked upon as a specific for syphilis. Chemically the drug is dioxydiamidoarsenobenzol dihydrochloride. Salvarsan may be given intravenously, well diluted with normal saline solution, or injected in small quantities into the muscles. In certain syphilitic affections of the central or cerebrospinal nervous system its effects are more potent if injected directly into the spinal canal in the form of salvarsanized serum. Salvarsan is credited with very rapid elimination of the spirochætæ of syphilis, and it was at first thought that one full dose would eradicate the disease—*therapia sterilans magna*, in Ehrlich's phrase. This idea, however, has proved to be fallacious. Salvarsan is also a powerful remedy in relapsing fever, Vincent's angina, yaws (q.v.), and it is hoped may combat many protozoan diseases. On account of some fatalities following the injection of this drug, in addition to paralyses, paræsthesias, epileptiform seizures, and other nervous disturbances, a milder preparation was evolved, called neosalvarsan.

Neosalvarsan is chemically formaldehyde sodic sulphoxylate of dioxydamidoarsenobenzol, and its arsenic content is about two-thirds that of salvarsan. It occurs as an orange-yellow powder, and the dose must be injected, well diluted in watery solution, immediately after preparation. Neosalvarsan has proved to be less toxic but also less potent than salvarsan. See Syphilis.

SALVATIERRA, säl'vä-tē-âr'rä. A town in the State of Guanajuato, Mexico, on the river Lerma and on the National Railways of Mexico, 18 miles south of Celaya (Map: Mexico, J 7). Its most important manufactures are those of cotton goods. Pop., 1900, 10,393; 1910, 10,262. The town was founded in 1613 during the viceroyalty of the Count of Salvatierra, and two centuries later, April 16, 1813, was the scene of a bloody contest between the royal forces under Itúrbide and the independents commanded by Ramón Rayon.

SALVATION, Full. See Higher Life.

SALVATION ARMY, The. A religious organization aiming to evangelize the masses who are outside of the influence of the churches. It was founded in England by William Booth (q.v.), who began open-air meetings in East

London in 1865, independent of ecclesiastical connections, but himself still keeping in touch with Church people and finally established the East London Mission in an old wool house in Bethnal Green. The name of Christian Mission was assumed in 1869 and that of Salvation Army in 1878. Military terms were substituted for the ecclesiastical designations which were first adopted. Uniforms were devised for the laborers, which were intended to be distinctive but plain and inconspicuous and not to depart too noticeably from the usual costume. Hence they vary in different countries and are adapted to the national dress. The doctrines of the Salvation Army are in harmony with those of the orthodox churches. No distinctions are recognized except those of individual ability and piety, and women serve in all duties on precisely the same plane as men. Conventionalities are thrown aside and all permissible devices are adopted and practices followed that will attract popular attention. The system of government and the nomenclature are absolutely military.

For governmental purposes each territory, comprising a single country or a group of countries, is divided into provinces, the provinces into divisions. A division comprises from 10 to 50 corps. A corps is the evangelistic unit. The officers are general, commanders or commissioners, colonels, lieutenant colonels, brigadiers, majors, staff captains, adjutants, captains, lieutenants, and sergeants. While funds are derived from subscription, the aim is to make the corps self-supporting. The general was from the first, until his death in August, 1912, William Booth, who was ably seconded by his wife, Catherine (Mumford) Booth, until her death in 1890. For her absolute devotion to the work, for the part she took in the developing of its organization, and because of her vast personal influence upon most of its early officers, she has been called the mother of the Salvation Army.

In 1889 George Scott Railton was sent from England to the United States to organize the Salvation Army. What has been actually accomplished since that time, as well as its methods of work, are succinctly stated in the following table, the figures in which are for 1914–15.

Corps and outposts	904
Indoor meetings	190,836
Indoor attendance	7,593,332
Open-air meetings	152,567
Open-air attendance	16,977,293
Converts	49,112
Hotels	85
Accommodation	7,221
Beds supplied	2,139,078
Homes	139
Accommodation	3,239
Attendance	369,263
Slum posts	16
Families visited	36,923
Children sheltered	46,574
Rescue and maternity homes	34
Children's homes	5
Christmas dinners	352,657
Pounds of ice distributed	1,622,583
Pounds of coal distributed	5,574,775

The organization does efficient work in the prisons. In 1914–15 situations were found for 413 discharged prisoners. A unique department called the Missing Friends Department has been in operation for several years. In 1915 1141 inquiries were made and 274 missing friends were found.

The Salvation Army has extended its field until in 1915 its operations were carried on in 63 countries and colonies in Europe, Asia, Africa, the Americas, and Australasia. The Salvation Army work in America is divided into two departments, East and West, the headquarters of which are in New York and in Chicago. Miss Evangeline Booth has supreme charge of the work in the entire country. In 1906 the Army rendered most efficient financial aid to sufferers from the San Francisco earthquake.

The social operations of the Salvation Army have had a very wide and varied development during the last 20 years. They sprang primarily from the necessity of meeting temporal needs of many whom their evangelistic efforts were influencing. To-day the social operations include rescue homes, shelters, and boarding houses for women, industrial homes and shelters for men, day nurseries, slum settlements, fresh-air camps and homes, farm colonies, employment bureaus, free coal and ice distribution, missing friends bureau, prison department, poor men's lawyer, anti-suicide bureau, and other developments.

The Army issued 58 weekly and monthly periodicals, with a circulation averaging over 1,250,000 weekly. Among these may be mentioned the *War Cry*, weekly; the *Young Soldier*, weekly; the *Social Gazette*, weekly; and *All the World*, monthly. See also VOLUNTEERS OF AMERICA.

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SALVA'TOR. A name (cf. monitor) given to various large lizards, as the teju (q.v.), in reference to the belief that they warn persons of the presence of a crocodile or alligator.

SALVATOR. See PULMOTOR.

SALVATOR, LOUIS. See LOUIS SALVATOR.

SALVATOR ROSA. See ROSA, SALVATOR.

SALVE. See OINTMENT.

SAL'VIA. See SAGE.

SAL'VIA'NUS. A Christian writer, of the fifth century. He was a native of Cologne and during the latter part of his life was presbyter at Marseilles. He wrote several works on devotional subjects, of which there are extant *Adversus Avaritiam*, a treatise against avarice, which appeared in four books under the pseudonym of Timotheus (c.440 A.D.); *De Gubernatione Dei*, on the providence of God, a work in eight books, written during the inroads by the barbarians upon the Roman Empire; and nine pastoral letters. These works are valuable for their vivid descriptions of the life and morals of the period. The best editions are by Halm (Berlin, 1877) and by Pauly (Vienna, 1883). Salvianus' works appear also in Migne, *Cursus Patrologiæ*, liii. Consult Sir Samuel Dill, *Roman Society in the Last Century of the Western Empire* (2d ed., London, 1899), and W. S. Teuffel, *Geschichte der römischen Literatur*, vol. iii (6th ed., Leipzig, 1913).

SALVINI, sȧl-vē'nē, ALESSANDRO (1861–96). An American actor, son of Tommaso Salvini. Born at Rome, he was educated at Florence as a

civil engineer. He came to America in 1881 and after learning English became an actor and played with Clara Morris and Margaret Mather. His best rôle was D'Artagnan in *The Three Guardsmen*. He died at his father's home in Florence. Consult McKay and Wingate, *Famous American Actors of To-Day* (New York, 1896).

SALVINI, Tommaso (1829–1916). A celebrated Italian tragedian, born at Milan. His parents were actors, and when a boy he showed such talent for the stage that he was placed under the tuition of the great Gustavo Modena. After winning renown in juvenile characters he joined the Ristori troupe. In 1849 he entered the army of Italian independence, in which his services were conspicuous. After the war he appeared in the *Edipo* of Niccolini and achieved a great success. Alfieri's *Saul*, in which he played not long afterward, was perhaps the greatest of all his characters. In Paris, where he played Orosmane (in Voltaire's *Zaïre*), Orestes, Saul, and Othello, he was received with great enthusiasm. In 1865, at the sixth centenary of Dante's birthday in Florence, Salvini with the other great Italian actors, Rossi, Gattinelli, and Ristori, was invited to perform in Silvio Pellico's *Francesca da Rimini*. On his first appearance in the United States, in 1873, he was received with the greatest enthusiasm, and he returned repeatedly. Salvini never learned English, but when he spoke Italian and his company English no incongruity was noticed. In 1886 he and Edwin Booth played together for three weeks, Salvini as Othello and Booth as Iago. Salvini himself played these two parts interchangeably. His portrayal of Othello has perhaps never been surpassed in vivid power. He retired from the stage to his home in Florence in 1890, but returned in 1902 to take part in the celebration of Ristori's eightieth birthday. Alessandro Salvini was his son. He died on his eighty-seventh birthday, Jan. 1, 1916. Consult: *Leaves from the Autobiography of Tommaso Salvini* (New York, 1893); William Winter, *Shadows of the Stage* (ib., 1892); id., *The Wallet of Time*, vol. i (ib., 1913).

SALWIN säl'wēn', or **SALWEEN.** A river, over 1500 miles long, rising in the southeastern part of Tibet, flowing southward through the Province of Yunnan, China, and Burma, and emptying into the Gulf of Martaban, east of the delta of the Irrawaddy (Map: Burma, C 3). Almost the entire course of the river is through a narrow valley with steep sides; its flow is often extremely swift and it is frequently interrupted by rapids caused by rocky reefs extending across the channel. Its basin is narrow and the tributaries are nearly all very short, some of them entering the main stream by cataracts. In the dry season, stretches of sand and shingle are exposed, while the water rises 50 to 60 feet during the rains. Consequently the river is of little importance for commerce.

SALYANY, säl-yä'nĕ. A town in the Russian Government of Baku, Transcaucasia, situated on the Kur (Map: Russia, G 7). It is the centre of the fisheries of the Kur. Pop., 1910, 20,904, chiefly Tatars.

SALZA, Hermann von. See Hermann von Salza.

SALZBURG, zälts'burk. A duchy and crownland of Austria (Map: Austria, C 3). Area, 2767 square miles. Salzburg is one of the most mountainous regions of Austria. The Hohe Tauern, which rise on its southern frontier, branch off into numerous high spurs running northward and are separated from one another by deep valleys. The northern part is covered by a continuation of the Salzburg Alps and contains a number of isolated mountains, some of them exceeding 9000 feet in altitude. The chief river is the Salzach, a tributary of the Inn, which drains almost the entire area of the region. There are a large number of mountain lakes, some of them situated at a very high altitude and of remarkable picturesqueness. The mountainous surface of Salzburg makes it unfavorable for agriculture, and the proportion of arable land is very limited. The cultivation of cereals is of minor importance and the crops do not suffice for the domestic demand. Cattle raising receives considerable attention. Salzburg is rich in minerals and especially in salt, of which it supplies over 8 per cent of the total output of Austria. Iron, gold, and copper are also mined to some extent. The manufacturing industries are limited and consist chiefly of glass, iron, and marble works. The house industries are confined to the manufacturing of coarse cloth, stockings, and linen. There is a state tobacco factory, employing over 400 men. Salzburg has a local diet of 26 members and sends 6 representatives to the Austrian Reichsrat. Pop., 1910, 214,997, principally German Catholics. Capital, Salzburg (q.v.).

The town of Salzburg, built on the site of the Roman Juvavum, was made the seat of an archbishopric in 798. It gradually came into possession of an extensive district, and the archbishops of Salzburg occupied a prominent position among the ecclesiastical princes of the Holy Roman Empire. The archbishops expelled the Jews in 1498 and some 30,000 Protestant subjects in 1731–32. In 1802 the see was secularized and Salzburg became a temporal principality under Ferdinand, the dispossessed Grand Duke of Tuscany. In 1805 it passed to Austria and in 1810 to Bavaria, and in 1814 was permanently united with Austria.

SALZBURG. The capital of the Crownland of Salzburg, Austria, charmingly situated amid mountainous scenery on the Salzach, 73 miles east-southeast of Munich (Map: Austria, C 3). The old town on the left bank of the river, with its narrow streets, flat-roofed houses, but beautiful squares and fountains, is dominated by the Hohen-Salzburg citadel on the Mönchsberg, at an altitude of about 400 feet (1780 feet above sea level), reached by a cable railway. Four iron bridges connect the old with the modern section of the town. A bronze statue of Mozart, who was born here, adorns one of the spacious squares. The site of the ancient fortifications is now occupied by a handsome residential quarter. Among the interesting churches are the seventeenth-century late Renaissance cathedral, the twelfth-century Romanesque St. Peter's, and the thirteenth-century Franciscan church with an imposing Gothic tower. In the Benedictine abbey of St. Peter there is a library of over 70,000 volumes. The secular edifices include the Imperial palace, the government buildings, the former university buildings, and the Mirabell-Schloss, the former palace of the prince-bishops, with a valuable geological collection. Of special interest are the ancient burial ground of St. Peter and the summer riding school, with galleries hewn out of the solid rock. Among the educational institutions are the Museum Carolino-Augusteum, containing a valuable collection of antiquities;

a theological faculty, two upper Gymnasia, a normal school, a priests' seminary, and a public library of over 104,500 volumes. Interesting features in the vicinity in addition to the fortress of Hohen-Salzburg, already alluded to, are the Kapuzinerberg, with the Capuchin monastery, the Gaisberg, all commanding magnificent views, and the castle Hellbrunn, with gardens, theatres, etc. Pop., 1910, 36,210. For history, see SALZBURG, above. Consult Zillner, *Geschichte der Stadt Salzburg* (Salzburg, 1885–90), and Hans Widmann, *Geschichte Salzburgs* (2 vols., Gotha, 1907–09).

SALZBURG FESTIVAL. An Austrian musical festival held annually at Salzburg, where the works of Mozart and Haydn and other classic composers are rendered with scrupulous exactness. It ranks among the representative festivals of the world.

SALZKAMMERGUT, zälts'käm'mēr-gōōt. An alpine district covering the extreme southern portion of the Austrian Crownland of Upper Austria, together with parts of Styria and Salzburg. It is celebrated for its varied and picturesque scenery, embracing a series of beautiful lakes bordered by lofty, steep, and forest-covered mountains. The most noted of the lakes is the Traun, an expansion of the river Traun, which flows through the district. The principal resorts are Ischl and Gmunden. The Salzkammergut, as its name implies, is famous also for its immense salt deposits.

SALZMANN, zälts'mân, CHRISTIAN GOTTHILF (1744–1811). A German educator, born in Sömmerda, Thuringia, and educated for the Church at Jena. He was pastor at Rohrborn (1768–72) and then at Erfurt (1772–81), where he first proclaimed his belief in natural religion and his theory of isolation as a factor in moral education. In 1781 he was called to the Philanthropinum in Dessau to be teacher of morals and religion. Three years afterward he started at Schnepfenthal a school which became renowned throughout Europe. It celebrated its centenary in 1884. His more important books are the ironical *Krebsbüchlein* (1780), with directions for wrong education; *Karl von Karlsberg* (1783–88) and *Konrad-Kiefer* (1794), pedagogical fiction comparable to Pestalozzi's *Leonard and Gertrude;* and a *vade mecum* for the teacher, the *Ameisenbüchlein* (1806), showing the obverse of the *Krebsbüchlein.* His works on education and juvenile literature were collected and republished in 12 volumes in Stuttgart in 1845–46, by Wagner in *Klassiker der Pädagogik* (1900), and by Ackermann in *Bibliothek pädagogischer klassiker* (1897–1901). Consult the memoir published by the school (Leipzig, 1884).

SALZWEDEL, zälts'vā'del. A town of the Province of Saxony, Prussia, 110 miles southeast of Bremen, on the navigable Jeetze, a tributary of the Elbe (Map: Germany, D 2). It has some edifices interesting for their architecture and a valuable museum of prehistoric relics. The manufacture of pins, machinery, leather, and chemicals, and the weaving of damask and linen are the principal industries. Pop., 1910, 14,400. Salzwedel (1070–1170) was the capital of Altmark, the nucleus of the Prussian state.

SAMAIN, sà'măN', ALBERT VICTOR (1858–1900). A French poet, born at Lille. He studied at the Lycée and became an employee in the Prefecture of the Seine, a position which he held until his death. His first poems appeared in the *Mercure de France.* These were collected in 1893 as *Le jardin de l'infante,* to which was afterward added *L'Urne penchée* (1897). His other published volumes include *Aux flancs du vase* (1898), *Le chariot d'or,* and the lyric drama *Polyphème* (1901). His melancholy, refined verse is noted for its melody. Consult E. W. Gosse, *French Profiles* (London, 1905), and Amy Lowell, *Six French Poets* (New York, 1915).

SAMANÁ, sä'mà-nä', or SANTA BARBARA DE SAMANÁ. A seaport of Santo Domingo, situated on the north shore of the large Bay of Samaná, 64 miles northeast of Santo Domingo (Map: West Indies, E 3). It is the outlet for the fertile Vega Real and exports coconuts, bananas, and cacao. Pop. (est.), 4500.

SAMANG, sà-mäng'. A tribal group in the Malacca Peninsula. See SEMANG.

SAMANI, sà-mä'nē, and **DILEMI,** dĭ'lâ-mē. Two Persian dynasties of minor importance. The Samani, who traced their descent to the Sassanidæ (q.v.), destroyed the Saffarids in 900 A.D., when Amr, the sixth Saffarid monarch, was conquered by Ismail ibn Ahmad, the third ruler of the Samanid line, who established the real power of his house. Ismail extended his sway over Transoxania, Balkh, Herat, Seistan, Khorassan, Gurgan, Tabaristan, and Rai, but the Caspian provinces were lost in the reign of his son and successor, Ahmad II, who died in 913. There were 11 monarchs of this dynasty. After the death of Abd al Malik (dethroned 999), the last in the direct line, his brother, Ismail al Muntasir, maintained a resistance against the Alid dynasty, the conquerors of the Samanids, until 1004, when he fell a victim to treachery. The dynasty was a peaceful one, encouraging literature rather than conquest. Among the noteworthy names in Persian literature who flourished during this period were Rudagi (q.v.), Daqiqī (q.v.), and Firdausi (q.v.), who began his great epic, the *Shāhnāmah,* at the Samanid court.

The Dilemi, who came from the Province of Dilem, on the Caspian Sea and ruled the Province of Gurgan, were founded by Mardawi (928–935), who was murdered in a mutiny at Ispahan. The line had eight other rulers: Vashmgir (935–967), the younger brother of Mardawi, three times driven from his throne, which he thrice regained by the help of his ally, the Samanid Nuh I; Bistun (976); Kabus (976–1012), opposed by his son and successor, Minochir (1012–29); Anushirvan (1029–43); Dara or Iskander (1043–c.1060); Kai Kaus, who wrote his *Qābūsnāmah* in 1080 or 1082 for the guidance of his son and successor, Gilanshah; and Gilanshah (1082–c.1090), who was captured by the Seljuk Sultan Malikshah. (See SELJUKS.) Consult Mirchond, *Histoire des Samanides,* translated by Defrémery (Paris, 1845), and F. Justi, *Iranisches Namenbuch* (Marburg, 1895).

SAMAR, sä'mär. One of the Philippine Islands, the easternmost of the Visayan group. It is situated between lat. 10° 42′ and 12° 43′ N. and between long. 124° 12′ and 125° 49′ E. (Map: Philippine Islands, E 4). On the northwest it is separated from the southeastern extremity of Luzon by the Strait of San Bernardino, 10½ miles wide, and on the southwest the Strait of San Juanico, 1 mile wide, separates Samar from Leyte. It is roughly oval in shape, narrowing into a long pointed peninsula in the southeast, and has an extreme length from northwest to southeast of 156 miles with an average breadth of 50 miles. Its area is 5031 square miles, ex-

cluding about 150 small dependent islands covering 245 square miles and forming a part of the Province of Samar. It ranks third in size among the islands of the archipelago.

The island has a very irregular surface, a series of hills and deep valleys, but no heights exceeding 1800 feet exist. The coast line, especially the eastern, is finely indented, and small islets, rocks, and headlands make the approach difficult. The mountain region of the interior forms a forest-covered and little-exposed wilderness.

The mineral wealth of Samar has not been well explored and is not yet being exploited, partly owing to the hostility of the natives in the interior. Coal, gold, copper, and cinnabar are, however, reported in quantities of commercial value. The climate and soil of the island are well suited to the production of all the staple crops of the archipelago, but only a small percentage of its area is under cultivation. It is estimated that in 1915 about 46,000 acres were devoted to abocá (hemp) and coconuts, the two principal crops. In 1913, 19,698,869 kilograms of abaca and 5,374,845 kilograms of copra were exported. Sugar, rice, coconuts, pineapples, bananas, cacao, tobacco, sweet potatoes, and cereals are among the products. Industrially the province is one of the least developed in the Philippines. There are practically no roads in the island, and means of communication are confined to the waterways along the coasts and the rivers, most of the latter being navigable for native boats. All the towns and nearly all the villages are situated on navigable water, and there is a considerable coasting trade. The inhabitants, whose number was 222,690 in 1903, are almost of pure Visayan stock and speak the Visayan language. The island with its dependent islets forms a single province (pop., 1903, 266,237), whose capital is Catbalogan (q.v.).

Samar was one of the last of the Visayan islands to remain in active insurrection against the United States, and its pacification presented considerable difficulties, as the natives burned their villages and took refuge in the pathless wilderness of the interior. Not till the beginning of 1902 did sufficient American forces arrive to begin active operations in the field, and on February 18 Lukban, the chief leader of the Visayan insurgents, was captured. His successor, Gueverra, surrendered with all his followers to General Smith in April, and in June, 1902, civil government was inaugurated in the island. Consult the authorities referred to under PHILIPPINE ISLANDS.

SAMARA, sȧ-mä′rȧ. A government of eastern Russia (Map: Russia, H 4). Area, 58,321 square miles. The region is divided by the Samara, a tributary of the Volga, into two parts, of which the northern is largely hilly and abundantly watered, while the southern has the character of a steppe with a slight elevation in the southeast. The principal river of Samara is the Volga, which forms its west boundary for over 600 miles. Samara presents, from north to south, all varieties of soil, from fertile black to limy brown. Agriculture is the principal occupation and a considerable proportion of the product is exported. There are over 10,000,000 acres under cultivation, chiefly under wheat, rye, oats, and potatoes. The German colonists cultivate tobacco on an extensive scale. The population is very cosmopolitan and was 3,658,900 in 1912, mostly Great and Little Russians.

SAMARA. The capital of the government of the same name in eastern Russia, situated at the junction of the Samara with the Volga, about 740 miles southeast of Moscow (Map: Russia, H 4). It has an excellent port and immense grain storehouses. Its chief industry is milling, but it has also industrial establishments of considerable importance. There are a seminary for teachers, a seminary for priests, and a public library with a museum of antiquities. It is the see of a Greek Catholic bishop. The trade in grain, flour, tallow, hides, wool, and horses is very extensive. Samara was founded as a fort in 1586. Pop., 1911, 145,568.

SAMARAI. See PAPUA.

SAMARANG, sä′mä-räng′. The capital of the residency of the same name in Java, situated on the north coast, at the mouth of the river of Samarang and about 250 miles east-southeast of Batavia (Map: East India Islands, D 7). It is an important commercial centre, although its harbor is very defective and practically inaccessible during the monsoon. Pop., 1905, 96,660, including 5126 Europeans and 13,636 Chinese.

SAMA′RIA. The central division of ancient Palestine (q.v.).

SAMARIA (Heb. *Shōmĕrōn*, probably watch or guard, Aram. *Shamrayin*, Gk. Σαμάρεια, *Samareia*, Σεμερών, *Semerōn*, Σομορών, *Somorōn*, Σεμαρεών, *Semareōn*, Lat. *Samaria*). A city of ancient Palestine (Map: Palestine, C 3), made the capital of the Kingdom of Israel by Omri (c.903–872 B.C.). According to 1 Kings xvi. 23–24, after reigning six years at Tirzah, Omri bought the site from one Shemer and named the city which he built there after the original owner. It was situated on a hill of more than 300 feet elevation, isolated on all sides except the east. It was about 6 miles northwest of Shechem and commanded the road northward to the plain of Esdraelon and westward to the coast. It was thus well adapted for a fortified capital. The Syrians laid siege to it during the reign of Ahab (1 Kings xx. 1) and again in the time of Joram (2 Kings vi. 24 et seq.), but did not capture it. It was invested by Shalmaneser V, King of Assyria, and after a siege of three years (725–723) was taken by him, as the biblical account and the Babylonian chronicles indicate, in 723 B.C., and not by Sargon II (722–705), as this King claims. The city rebelled again in 720 B.C. After this insurrection had been quelled Sargon carried away 27,290 persons from Samaria to Mesopotamia and Media. In 715 B.C. he deported from northern Hejaz four Arabic tribes, among them the Thamud, to Samaria; and this foreign population was increased with Elamites, Babylonians, and Syrians sent by Asurbanipal after 645 B.C. Samaria was captured by Alexander the Great (331 B.C.), who killed many of the inhabitants and replaced them with Macedonian colonists. It was taken and completely destroyed by John Hyrcanus (c.120 B.C.), but was soon rebuilt, and remained in the possession of the Jews till Pompey restored it to the descendants of the expelled Samaritans. It was fortified by Gabinius. Augustus gave the town to Herod the Great, who rebuilt it with much splendor and called it Sebaste, after the Emperor (Σεβαστή, from Σεβαστός = Augustus). Philip the Evangelist preached Christianity in Samaria (Acts viii. 5), and in the third century it was an episcopal see. A Greek bishop still derives his title from

Sebaste. After the Mohammedan conquest of Palestine the importance of Sebaste declined. It is now a small village (Sebastiyeh). Excavations were undertaken by Harvard University in 1908–09. The walls of the palace built by Omri and greatly enlarged by Ahab were unearthed. An alabaster vase was found bearing the name of Osorkon II of Egypt (c.920–891 B.C.). Over 70 potsherds were found inscribed with ink dated in various years of the King's reign. They probably come from Ahab's time. The temple of Augustus has also been excavated. Consult: Dalman, "Die Stadt Samaria und ihre Verkehrswege," in *Palästinajahrbuch*, vol. ii (Jerusalem, 1906); articles by D. G. Lyon in *Harvard Theological Review* (Cambridge, 1909, 1911); Vincent, in *Revue Biblique Internationale* (Paris, 1911); Thiersch, in *Zeitschrift des deutschen Palästinavereins* (Leipzig, 1913).

SAMARITAN LANGUAGE AND LITERATURE. The Samaritan belongs to the Semitic languages and may be grouped with the western Aramaic dialects, although it contains strong admixtures of Hebrew. It is no longer spoken, but is still studied by a few priests in the small Samaritan community (see SAMARITANS) at Nabulus, where the common speech is now Arabic. The dialect is interesting from a philological point of view, both because of its antiquity and of its mixed character. Its history may be traced back to the fourth century B.C., but its beginnings belong to a still earlier date. That it survived the Arabic conquest is due to the sacred character it acquired for the Samaritans by virtue of the translation of the Pentateuch into their dialect. The alphabet represents a comparatively slight modification of the Old Semitic in which the Phœnician and early Hebrew and Aramaic inscriptions were written, and differs from the square letters used in later Aramaic and Hebrew inscriptions and in Hebrew manuscripts. (See ALPHABET.) Its phonology presents some peculiar characteristics, the most pronounced being the practical loss of guttural sounds, which leads to considerable confusion in the writing of words containing guttural letters. Its morphology presents no unique features, while its vocabulary contains many foreign words borrowed from Arabic, Latin, and Greek. The literature is of small extent. Besides the Samaritan Pentateuch (q.v.) and Targum (see SAMARITAN TARGUM) it consists of chronicles, liturgies, and hymns. The chronicles include: 1. The *Samaritan Book of Joshua*, an Arabic chronicle, ascribed by critics to the thirteenth century, taken in part from the canonical Book of Joshua, with legendary additions that charge the Jews with being oppressors of the Samaritans and, after the time of Eli, apostates from the faith. The narrative is continued to 350 A.D., when it abruptly ends. 2. The *Chronicle of the Generations*, professedly written by Eleazar ben Amram, 1142, and afterward continued by many hands; it gives a calculation of sacred times, the age of patriarchs, and a list of high priests. 3. The *Chronicle of Abulfath*, written about the middle of the fourteenth century, is drawn from the two previous works, with additional legendary matter. The liturgies and hymns belong to different periods. Consult: H. Petermann, *Brevis Linguæ Samaritanæ Grammatica* (Berlin, 1873); S. Kohn, *Zur Sprache, Litteratur und Dogmatik der Samaritaner* (Leipzig, 1876); id., *Samaritanische Studien* (Breslau, 1868); J. A. Montgomery, *The Samaritans, the Earliest Jewish Sect* (Philadelphia, 1907).

SAMARITAN PENTATEUCH. A recension of the Hebrew text of the Pentateuch, used by the Samaritans and written in a slightly modified form of the North Semitic alphabet (see ALPHABET) employed by them. The first printed edition appeared in the Paris polyglot (1632). It was prepared by Jean Morin, who used a manuscript now in the Bibliothèque Nationale. It was reprinted in the London polyglot (1657). Blayney used several manuscripts for his edition, printed in the square Hebrew characters (Oxford, 1790). A critical edition by Gall is in process of publication. It also is printed in Hebrew characters, is based on about 80 complete manuscripts and fragments, presents necessarily an eclectic text, but gives numerous variants of the manuscripts consulted. The earliest complete manuscripts seem to come from the thirteenth century; some fragments belong to the twelfth. The famous codex preserved at Shechem was apparently written in 1218. Some extant manuscripts have not yet been examined. The Samaritan recension shows a large number of variants from the Masoretic text. Hundreds of them are of small significance, but some are important. In Gen. ii. 2 it reads: "On the sixth day God finished his work"; in Gen. iv. 8 it gives the words of Cain, lacking in the Masoretic text: "Let us go into the field"; and in Gen. v and xi the chronology of the patriarchs is different. The ordinance, Ex. xiii. 6, reads, "six days shalt thou eat unleavened bread," and not "seven days." There are about 20 more or less extensive additions in Exodus, Numbers, and Deuteronomy, which either are interpolations to make the narrative read more smoothly or represent the original text that has suffered in the Masoretic recension. On the other hand, the text in Ex. xxxv–xl is shorter. In Deut. xxvii. 4 it reads "Gerizim" and not "Ebal," and there is much to be said in favor of the former reading. (See EBAL AND GERIZIM.) In many passages it agrees with the oldest Greek version against the Masoretic text, in others it differs from both. On the whole its type of text seems to be later than that from which the Greek version was made and approaches nearer to the Masoretic. Its similarities to that used in the Book of Jubilees confirm this impression. In their transmission of the text, as well as in its interpretation, the Samaritans, whose high priests belonged to a branch of the Zadokite family in Jerusalem, were undoubtedly influenced by the Jews, especially before the time of the Hasmonæans. Consult A. von Gall, *Der hebräische Pentateuch der Samaritaner*, vols. i, ii (Giessen, 1914), and W. Gesenius, *De Pentateuchi Samaritani Origine, Indole et Auctoritate* (Halle, 1815).

SAMARITANS. A term used to designate the inhabitants of the Province of Samaria after the Assyrian conquest and in later times the members of a religious community having its centre in Shechem (Nabulus) and the neighboring Mount Gerizim. The territory of Samaria became for the first time a distinct political organization after Gilead and Galilee had been captured by the Assyrians in 734 B.C. The city of Samaria was probably taken by Shalmaneser V in 723 B.C., but Sargon II claims the victory and undoubtedly carried away a part of the

population, according to his own account 27,290 persons. The bulk of the Israelitish population remained in the land subject to the same tribute as before (*Display Inscription*, 24). In 720 B.C. Samaria united with Hamath, Arpad, Simyra, and Damascus in an unsuccessful rebellion. A number of Arabian tribes, such as the Thamud, Ibadidi, Marsamani, and Hayapa, were settled in the district of Samaria by Sargon in 715 B.C. According to 2 Kings xvii. 24 the King of Assyria brought men from Babylon and from Cuthah and from Ava and from Hamath and Sepharvaim and placed them in the cities of Samaria. It is probable that this King of Assyria was Asurbanipal (668–625 B.C.). This is undoubtedly the King meant by "the great and noble Asnapper," who, according to Ezra iv. 9–10, brought a number of Elamitish and Babylonian peoples into the Province of Abar Nahara, or Trans-Euphratene. Such deportations would be natural after the conquest of Elam in 645 B.C. and the quelling of Shamash-shum-ukin's insurrection in Babylon, Cutha, and Sippara in 648 B.C. The statement in Ezra iv. 2 that the people of the land had been brought up by Esarhaddon is from the hand of the chronicler and deemed by some scholars unhistorical. The inhabitants of the Province of Samaria in the Chaldæan and Persian periods were consequently made up of the descendants of the Israelites, who had never been deported, and of the Arabs, Babylonians, and Elamites settled there by Sargon and Asurbanipal. The Israelites naturally continued the worship of Yahwe and retained the local traditions and the household gods honored by their fathers. The others added the worship of "the god of the land" to their veneration of the gods of their fathers. But the gradual assimilation of the foreigners to the native stock involved the ascendancy of the Yahwe cult.

According to Ezra iv. 1–5 the enemies of Judah and Benjamin, by which no doubt the Samaritans are meant, desired to participate in the building of the temple in Jerusalem, but were refused permission to do so and therefore conceived a hatred of the Jews. The accuracy of this narrative has been questioned by some scholars. In order to show that the completion of the temple was prevented by enemies until the second year of Darius, the chronicler refers to a letter sent to Xerxes and another sent to Artaxerxes by Tabeel, neither of which is given, but produces in extenso the text of letters written by Rehum and Shimshai to Artaxerxes, by Tatnai and Shetharboznai to Darius, by Cyrus, and by Darius. These letters, found in Ezra iv–vi, are written in Aramaic. There is nothing in them to indicate which of the several kings who bore the names Xerxes, Artaxerxes, and Darius is intended; all the kings bearing the names Xerxes and Artaxerxes reigned after Darius I, in whose time the temple was actually built, and in the letters to these kings there is no reference to the building of the temple. There must therefore be some confusion on the part of the chronicler, even if the documents are genuine. Eduard Meyer maintains that the documents are substantially accurate copies of an actual correspondence. But they are still rejected as spurious, on linguistic and historical grounds, by Torrey (1910) and Wellhausen (1914), and it is not easy to see how the chronicler could have had access to the copies kept in Samaria. The most valuable historical work in Hebrew from the Persian period is the Memoirs of Nehemiah. It has been supposed that Sanballat, Tobiah, and Geshem, the enemies of the Judæan governor, were Samaritans. Tobiah was an Ammonite, Geshem an Arab, probably a Nabatæan, and Sanballat a Horonite. It has been suggested that the last of these was a Moabite from Horonaim. This is not impossible. But there can be no question that he was governor of Samaria. This is now certain from the Elephantine papyri (q.v.), in which the sons of Sanballat are mentioned as in authority in Samaria in 411 B.C.

According to Josephus (*Ant.*, xi, 7, 2; 8, 2 et seq.) Sanballat, a Cuthean, was sent to Samaria as satrap by Darius III (336–330 B.C.) and was permitted by Alexander to build a temple on Mount Gerizim, where he made Manasseh, his son-in-law, high priest. He evidently identified this Manasseh with the unnamed son of Joiada in Neh. xiii. 28, who was the son-in-law of Sanballat and was driven away by Nehemiah, and the Jaddua who was high priest in the time of Alexander with the son of Johanan, Joiada's brother (Neh. xii. 22). Josephus has no doubt made a mistake, but it is reasonable to suppose that he knew the name of the founder of the Samaritan temple, the time when it was built, and who was high priest in Jerusalem in the days of Alexander, even though the Jaddua legend be without any historical foundation. The temple on Mount Gerizim was therefore, in all probability, built in 332 B.C., though no doubt there existed long before this time a shrine upon this mountain. How much of the older Israelitish literature was preserved in Samaria in the Persian period is not known, nor to what extent the Yahwe-worshiping communities there kept in touch with their kinsmen in Judæa. Their deep interest in the Mosaic period and the religious associations of their own sacred places would naturally render them anxious to possess every document known to them as claiming Mosaic authorship. An evidence of such a desire to know and to practice what Moses taught is the fact that the Pentateuch (see SAMARITAN PENTATEUCH) was accepted by the Samaritans. The consciousness of worshiping Yahwe in the place where he had commanded that an altar should be built and benedictions pronounced (see EBAL AND GERIZIM) must have given a strong impetus to the Samaritan movement. It is not likely, however, that the centralization of the cult could be carried out everywhere in the province. The city of Samaria seems to have been Hellenized at an early date, and the same is true of Scythopolis. Nor is it probable that those who lived in the Egyptian town of Samaria mentioned in papyri from the reign of Ptolemy II (285–247 B.C.) were adherents of the Shechemite faith. Jews and Samaritans may indeed have disputed about the legitimate place of a Yahwe sanctuary in the time of Ptolemy VII Philometor (181–145 B.C.), though it is not likely that this discussion was held before the King and that the deported Samaritans were put to death. It is generally recognized that no credence can be given to the alleged request of the Samaritans to Antiochus IV (175–164 B.C.) for permission to dedicate their temple to Zeus Xenios (*Ant.*, xii, 5). 2 Maccabees vi. 2 knows of no such request. While the Samaritans did not take a part in the Maccabæan revolt, they profited

from it at first, as the Seleucid rulers abandoned their policy of suppressing the native cults. The worship of Yahwe on Mount Gerizim could consequently be resumed. But the expansion of the Jewish power proved disastrous to the Samaritans. Jonathan secured possession of three districts, Ephraim, Lydda, and Ramathaim (1 Macc. xi. 34), and John Hyrcanus destroyed the temple on Mount Gerizim. In 107 B.C. the entire Province of Samaria became Jewish territory after the fall of the city. Though the temple on Gerizim was not rebuilt, it is probable that a smaller shrine existed there even during the Hasmonæan period. Pompey, in 63 B.C., restored Samaria and Scythopolis as free cities, and Gabinius (57–55 B.C.) rebuilt Samaria and permitted Samaritans to dwell in the city. It was rebuilt on a still grander scale by Herod (37–4 B.C.) and given the name Sebaste in 27 B.C.

Even the city of Shechem was not uninfluenced by foreign thought. An evidence of this is the rise of sects, such as the Essenes, Sabuæans, Gorthenes, and Dositheans. The Essenes show so marked a kinship to Neo-Pythagoreanism that it must be accounted for either by direct influence or by a common Oriental source; and the Dositheans seem to have derived from Greek philosophy the notion of the eternity of matter, while they adhered to the traditional idea of the future and rejection of the doctrine of a resurrection or the immortality of the soul. It is not probable that Dositheus regarded himself as the Messiah, nor can this be affirmed of either of the political leaders who in 36 A.D. and in 66 A.D. were punished by Pontius Pilate and Ceratus, or of Simon of Gitta. (See SIMON MAGUS.) It is probable that the repudiation of the sects led the great body of the Samaritans nearer to the Pharisaic party. Especially after the fall of Jerusalem in 70 A.D. the intense zeal for the law formed a bond of union, and the participation of the Samaritans in the revolt under Hadrian tended to improve the relations. Eminent Jewish teachers, such as Rabbi Akiba and Rabbi Simon ben Gamaliel, regarded them as coreligionists and their land as clean. In 193 Jews and Samaritans seem to have taken sides together with Piscennius Niger against Septimius Severus, and as a consequence Shechem was severely punished. During the third century the attitude of the Jews changed. In the reign of Diocletian (284–305) Rabbi Abbaha held that the Samaritans should be treated as pagans. Christianity gradually won its way into Shechem. Bishops of Neapolis and Sebaste were present at the Council of Nicæa (325). During the fifth and sixth centuries the Samaritans were subject to cruel persecutions by the Christian emperors, leading to revolts under Zeno in 484 and Justinian in 529. From the Imperial decrees against them it is evident that Samaritans lived in Egypt and Cyrenaica, in Rome and Constantinople, as well as in Syria. Arabic writers such as Masudi (died c.950), Biruni (died 1038), and Shahrastani (born 1086) speak of Samaritan communities in Assyria and Egypt. After the capture of Jerusalem by the Crusaders in 1099, Nabulus freely accepted Christian rule, which continued until Saladin's victory at Hittin in 1187. The Mamelukes of Egypt ordered the Samaritans to wear red turbans in 1301, according to Suyuti and Al Fath, and Wilhelm of Baldensel in 1336 found such in use. In 1516 Nabulus with the rest of Syria passed under Turkish rule. In answer to letters sent by Joseph Scaliger epistles were forwarded to him in 1590 from Samaritans in Gaza and Cairo. Pietro della Valla in 1616 and 1625 found Samaritans not only at Nabulus, but also in Cairo, Gaza, Damascus, and Jerusalem. In 1672 Robert Huntington visited Nabulus, where he found 30 Samaritan families. As he was able to read the Samaritan letters and assured them that there were Israelites in England, he left the impression that there were Samaritans in that country. They consequently opened a correspondence with the Sons of Israel, the Samaritans in the cities of the Franks, or more particularly "their brethren, descendants of Israel and Samaritans living in the city of Oxonia." Thomas Marshall answered these letters on behalf of the brethren in Oxford between 1672 and 1685. Three letters were also sent to Ludolf (1685–89). Niebuhr found Samaritans at Nabulus, Jaffa, Jerusalem, and Damascus in 1766. A letter to Corancez in 1808 states that there were 200 Samaritans in Shechem and Jaffa. A number of letters were written by the Samaritans to Silvestre de Sacy between 1808 and 1826, and during the reign of Louis Philippe an appeal was made by them to the French government. Robinson visited Nabulus in 1832, Bargès in 1854, Petermann in 1872, and many scholars since. At present fewer than 200 persons survive of the Samaritans, all in Nabulus (q.v.).

While the Samaritans have at all times agreed in recognizing the authority of the law only, and in regarding Mount Gerizim as the only legitimate place of worship, they have manifestly changed their opinion on many other questions under the influence of foreign thought. Thus there is no reason to doubt the practically unanimous testimony of early writers that the Samaritans did not accept the doctrines of a resurrection or the immortality of the soul. But, surrounded as they were by Jews, Christians, and Mohammedans looking forward to a resurrection of the dead, it is not strange that later they should have adopted this belief. It is found in the *Carmina Samaritana*, in the Chronicles of Abulfath, and in the letters to European scholars. Since the Samaritans rejected the prophetic books and the Psalms in which Jewish exegesis especially found references to the Messiah (q.v.), they could not share the hope of a king, a son of David. But Deut. xviii. 18 suggested the coming of a prophet like unto Moses. In the earliest testimony to a Samaritan Messiah (John iv. 25) his character is that of a prophet. In later times the Messiah was called the *Ta'eb* (the returning one). It is found in Abulfath, the Songs, and especially in the Gotha Code (963). Many interpretations of the law, also found among Sadducees and Karaites, have no doubt preserved old traditions. But the limitation of levirate marriage to betrothed virgins, the stricter regulations as to intercourse with pregnant women, and the purification of unclean places by fire seem to point to Indian and Persian influence. The Samaritans of Nabulus go in pilgrimage to Mount Gerizim annually for each of the three great feasts. They offer sacrifice only at the Passover. See SAMARIA; SAMARITAN LANGUAGE AND LITERATURE; SAMARITAN PENTATEUCH; SHECHEM.

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SAMARITAN TARGUM. A translation of the Hebrew text of the Pentateuch preserved among the Samaritans into the Aramaic dialect spoken by them. It contains many errors of translation, has suffered greatly in transmission, and has not yet been edited with sufficient care. It is valued as the only source of our knowledge of the Samaritan dialect of the Aramaic, and also because it reveals the same tendencies of thought as the Jewish Targums (see BIBLE) and probably Jewish influence. It was published in the Paris and London polyglots, and by Petermann-Vollers under the infelicitous title *Pentateuchus Samaritanus* (Berlin, 1872–91). Consult: J. W. Nutt, *Fragments of a Samaritan Targum* (London, 1874); Kohn, in *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, vol. xlvii (Leipzig, 1893); Kahle, *Fragmente des samaritanischen Pentateuchtargums* (ib., 1902); J. A. Montgomery, *The Samaritans, the Earliest Jewish Sect* (Philadelphia, 1907). The Arabic Targum often found side by side with the Hebrew text of the Samaritan Pentateuch has generally been ascribed to Abu Said of the thirteenth century, but this version is likely to have been made by Abu'l Hasan of Tyre in the eleventh century, and Abu'l Barakat. Genesis, Exodus, and Leviticus were edited by Kuenen (Leyden, 1851–54), and a part of Deuteronomy by Josef Bloch in his *Die samaritanisch-arabische Pentateuchübersetzung* (Berlin, 1901).

SAMARKAND, sâm'âr-kând'. A territory in Russian Turkestan (Map: Asia, Central, M 2). It has an area of 26,627 square miles. The southern part, which belongs to the Pamir Alai mountain system, is exceedingly mountainous and reaches an altitude of over 18,000 feet with passes above 12,000 feet. Elevations of 7000 feet are found in the northeast. The northern part of the territory belongs partly to the barren and waterless Famine Steppe and partly to the desert of Kizilkum. The principal river is the Zerafshan, which drains with its numerous tributaries the southern part of the territory and feeds the irrigation canals which are so essential to agriculture in Samarkand. The Syr-Darya flows through the northeastern part of the territory. There are also numerous salt lakes, of which Tuz-khan yields large quantities of salt. The climate is hot, dry, and changeable in the lower parts of the territory and severe in the mountainous regions. The precipitation is very scanty, and malaria is peculiar to some of the valleys. Samarkand is believed to possess great mineral wealth.

The agricultural land of Samarkand is found principally in the south, along the Zerafshan and its tributaries. There are at present in the territory over 1,000,000 acres of land reached by irrigation, and a considerable proportion of it yields two crops a year. The principal products are wheat, barley, and other cereals. Cotton and rice are raised in increasing quantities. Sericulture and viticulture are also attaining great importance. Stock raising is carried on principally by the nomadic Kirghizes. Silk and woolen goods are produced by the natives, and there are a number of large cotton-gin mills and flour mills. Cotton and cereals are the principal exports. The population of the territory in 1913 was 1,194,000, almost exclusively Mohammedans. The Uzbegs form over two-thirds of the total population.

SAMARKAND. The capital of the territory of the same name in Russian Turkestan, the mediæval capital of Timur, and one of the most famous cities of Central Asia, situated about 5 miles south of the Zerafshan, with which it is connected by a number of canals, on the Transcaspian Railway, and about 140 miles east of Bokhara (Map: Asia, Central, M 3). It lies at an altitude of over 2200 feet. Samarkand consists of the native city and the new Russian town, separated from each other by the citadel. The native city is still partly surrounded by a wall, and its magnificent architectural monuments testify to its former splendor. Its centre is the vast square of Righistan, around which stand three of the madrasahs for which Samarkand is famous.

Northeast of the square of Righistan stands the ruined madrasah of Bibi-khan, attributed to one of Timur's wives. It incloses a number of mosques and a mausoleum over the graves of the wives of that ruler. The mausoleum with the tombs of Timur, his teacher, and relatives, is crowned with a beautiful dome of blue tiles, and the interior of the room which contains the tombs is ornamented with arabesques and gold inscriptions. The finest mosque of Samarkand, and one of the finest in Central Asia, is that of Shah-Zindeh, outside of the city walls, among the buildings of the summer palace of Timur. It is held in high veneration on account of the remains of Shah-Zindeh (a companion of Timur), which it contains, and its interior decorations are probably the most beautiful in Central Asia.

The buildings of the citadel are used by the Russians for military purposes. The environs of the city are full of ancient ruins. The Russian part of Samarkand is well built, having many modern public buildings. The industries of the native population are important, and their products comprise cotton and silk goods, wine, leather goods, pottery, and silver and gold wares. The bazars are still extensive and picturesque, but the commercial importance of the

city has decreased since the extension of the Transcaspian Railway to Tashkent and Andizhan. The chief exports are cotton, rice, silk and silk goods, fruit, hides, and wine. In 1910 Samarkand had a total population of 89,693.

Samarkand is identified with the ancient Marakanda, the capital of the Persian Province of Sogdiana, which was destroyed by Alexander the Great in 329 B.C. In the seventh century it was conquered by the Arabs, under whose rule it became a great religious and intellectual centre. Conquered and pillaged by Genghis Khan in the early part of the thirteenth century, Samarkand was restored by Timur at the close of the fourteenth century and attained its greatest magnificence as the residence of the great conqueror. After the breaking up of the Empire of Timur Samarkand passed to the Emir of Bokhara, from whom it was wrested by Russia in 1868.

SAMAROFF, sä'mȧ-rôf, Olga (1882–). An American pianist, born at San Antonio, Tex. Having received her first musical instruction from her grandmother, she entered the Paris Conservatory in 1895. In Berlin she finished her studies under Jedliczka. Upon her début in New York in 1905 her success was instantaneous, and for several seasons she appeared throughout the United States with orchestra and in recitals. In 1911 she married Leopold Stokowski (q.v.).

SAMAROW, zä'mȧ-rôv, Gregor. See Meding, Oskar.

SAMARSKITE, sȧ-mär'skīt (named in honor of the Russian Samarski). A mineral composed of the oxides of a number of rare metals, including cerium, yttrium, columbium, tantalum, etc. It has a vitreous to resinous lustre and is of a dark or black color. The mineral finds some use in commerce for the mantle employed by the Welsbach light.

SAMA-VEDA, sä'mȧ-vā'dȧ. See Veda.

SAMBAR, säm'bar (from Skt. *śambara,* sort of deer). The largest of Oriental deer (*Cervus unicolor*). It is from 4 to 5 feet high and wears large and heavy antlers. These spread sometimes to a width of 36 inches and have very

A SAMBAR STAG.

large, much roughened beams with only two tines, one near the extremity and the other a broad tine set at an acute angle. Its range covers nearly the whole Oriental region, and it is everywhere a deer of the forests. Its hair is coarse and wiry and forms a mane on the neck, and its color is dark brown, lighter on the buttocks and ventral surfaces. The fawns are not spotted, as is usual with deer. In the Malayan Islands there occur several small sambar-like deer, which are believed by many to be related to the mainland species. One of these doubtful species (*Cervus philippinus*) belongs to the Philippine and Ladrone islands, is scarcely 24 inches tall, and has the brow tines shorter than the terminal prongs. Another closely related Philippine deer is *Cervus alfredi,* which is larger and has a coat spotted—yellow upon chocolate brown—at all seasons. Consult authorities cited under Deer.

SAMBATION, sȧm-bā'tē-ôn, or **SABBATION,** sȧb-bā'tē-ôn (Heb., from *Shabbāth,* Sabbath). A mystic river of Jewish legend. The earliest references are found in Josephus and Pliny. The former (*Bel. Jud.,* vii, 5, 1) says that Titus visited such a river in the neighborhood of Beirut and that it flowed only on the seventh day. Pliny (*Nat. Hist.,* xxxi, 18) relates, in connection with other like marvels, that "in Judæa there is a river which dries up every Sabbath." Both Talmuds refer to it, and the Midrash Rabba to Genesis (§ 11) takes it as a proof of the divine ordinance concerning the Sabbath. In later legend the river became the miraculous protection of the exiles against their enemies. The most extensive form of the story is found in the narrative of "Eldad" (ninth century, printed in Jellinek's *Beth-hamidrasch,* iii, 6, Leipzig, 1853–57). Various attempts have been made to locate this strange stream, and it has been identified especially with the Zab in Assyria. Doubtless the story is based on the report of an intermittent stream in some part of the world. The elements of the legend are found in the Alexander Romance (*Pseudo-Callisthenes*), where a river flowing three days with water and three days with sand is assigned to Egypt. There is also a reference to the river as existing in India in the legend of Prester John. Consult F. Hamburger, *Realencyclopädie des Judentums,* vol. ii (Strelitz, 1883); a very full discussion may be found in M. Lewin, *Wo wären die zehn Stämme Israels zu suchen?* (Pressburg, 1901).

SAMBOR, säm'bôr. A town in the Crownland of Galicia, Austria, on the Dniester, 47 miles southwest of Lemberg (Map: Austria, H 2). It manufactures oil and linen and trades in flax, hemp, agricultural produce, and cattle. Pop., 1900, 17,027; 1910, 20,260, mostly Poles. Sambor was captured by the Russians in the war which began in 1914. They were later compelled to evacuate it. See War in Europe.

SAM'BOURNE, Edward Linley (1844–1910). An English caricaturist, illustrator, and designer. He was born in London and studied for a short time at the South Kensington Art Schools. He had intended to be an engineer, but, his drawings having attracted the attention of Mark Lemon in 1867, Sambourne was employed by *Punch.* He first made a name with the social drawings and decorative initial letters contributed to this paper, and by 1901 he had become chief cartoonist. He is also well known as an illustrator. An extraordinary example of his invention and decorative ability is the Diploma for the Fisheries Exhibition (1883). Sambourne was one of the greatest masters of pure line of his day in England.

Consult M. H. Spielmann, *The History of Punch* (New York, 1895).

SAMBRE, săn'br'. A river of Belgium, 118 miles long. It rises in the Department of Aisne in north France, flows northeastward, and enters the Meuse at Namur (Map: Belgium, B 4). It is navigable 100 miles to Landrecies in France, whence the Canal de la Sambre connects it with the Oise. It flows through a very populous region, lies along one route from Paris to Berlin, and forms an important part of the internal waterways of France and Belgium.

SAMBU'CUS. See ELDER.

SA'ME, or SAMOS. See CEPHALONIA.

SAMIEL, săm'yĕl. See SIMOOM.

SAMKHYA. See SANKHYA.

SAM'NITES. 1. An ancient people of Samnium in the mountainous region of middle and southern Italy. They were an offshoot of the Sabines and belonged to the old long-headed prehistoric race. They comprised: (*a*) the Caraceni, on the north, whose capital was Anfidena; (*b*) the Pentri, in the centre, most powerful of all, with their capital Bovianum; (*c*) the Caudini, in the southwest; (*d*) the Hirpini, in the south. Their capital was Beneventum. The Samnites long fought against Rome, but were finally subdued. (See ROME, under the caption *From the Abolition of the Decemvirate to the Defeat of the Samnites, etc.*, (2) *External History.*) Their speech was Oscan. (See ITALIC LANGUAGES.) Consult R. S. Conway, *The Italic Dialects* (2 vols., Cambridge, 1897), and C. D. Buck, *A Grammar of Oscan and Umbrian* (Boston, 1904). 2. The name Samnites was given by the Romans also to certain gladiators. See GLADIATOR.

SAMO'AN ISLANDS, or **SAMO'A** (formerly NAVIGATORS ISLANDS). A group of islands in the Pacific Ocean, extending from lat. 13½° to 14½° S., and from long. 168° to 173° W. (Map: World, Western Hemisphere, L 4). They lie about 4200 miles southwest of San Francisco. The group comprises altogether 14 islands, of which only Savaii (660 square miles), Upolu (345 square miles), Tutuila (54 square miles), and the Manua group (26 square miles) are important. The total area is about 1100 square miles. The islands are all volcanic and mountainous, rising in Savaii to a height of 5413 feet. The region along the coast, however, supports a luxuriant vegetation, and the other islands are forest-clad to the summits of the mountains. The coasts are high and steep, but offer no very good harbors except that at Pagopago. Earthquakes are frequent, but seldom severe. See *History*, below.

The climate is tropical, with a mean temperature of 79° F. in December and 76° F. in July. The rainfall is abundant, but the islands are subject to severe hurricanes. The flora is similar to that of other Polynesian groups, and the fauna is extremely limited. The only indigenous mammals are the rat, the bat, the dog, and the pig. No snakes are found in American Samoa, but on the other islands, four nonvenomous species are found, only one of which exists on Upolu. Among the birds the most remarkable is a species of pigeon, the *Didunculus strigirostris*, which is interesting as being a link between the African Treroninæ and the dodo. It is now rigidly preserved in the hope of preventing its extinction.

The wealth of the islands consists principally in their rich vegetation. The soil is of extraordinary fertility and well watered. The staple product is copra, which is produced on a large scale on European plantations and which constitutes almost the sole article of export. Fruit is also an important product, and cacao is cultivated on an increasing scale. Aside from agriculture there are no economic industries. The imports and exports of the German portion of the Samoan group in 1912 were $1,214,000 and $1,228,000 respectively. The trade of the American island of Tutuila amounted in the same year to $93,690 for imports and $47,453 for exports. The chief port of the group is Apia (q.v.) on Upolu, but the best harbor is Pagopago (q.v.) in Tutuila, considered the best harbor in the South Pacific.

In 1914 Savaii and Upolu (qq.v.) and the adjacent islets belonged to Germany; and Tutuila (q.v.) and the Manua group to the United States. German Samoa was administered by an Imperial Governor and a native chief assisted by a native council. The American possessions are in charge of a naval Governor. There are a number of primary schools maintained by Protestant and Roman Catholic missions. The population of German Samoa in 1912 was 35,000; 540 were European, principally German, British, and American. American Samoa had 9048 inhabitants in 1912, of which Tutuila had 7251; 1920, 8,056.

The natives are typical Polynesians linguistically and physically. Their somewhat lighter skin and alleged Caucasoid features have led some ethnologists to class them as Indonesian and to assume their affinity with the white race of the Eurasiatic continent, together with the other Eastern Polynesians—Tongans, Marquesans, Hawaiians, Tahitians, etc. Like many other Polynesian peoples, the Samoans are often quite good-looking and are generally well formed. Tradition and legend make the Samoan Archipelago the centre from which a large portion of the island world of the Pacific was peopled. The most recent researches into Polynesian ethnology leave us without identification of the race anterior to their presence in Indonesia as far west as Sumatra, where the Mentawei Islands still hold an interesting enclave of this race. From Indonesia the race was expelled by the advance of Malayan culture slightly anterior to the Christian era. The earlier migration reached Samoa in two streams through Melanesia—one north of New Guinea and thence eastward by way of the Solomon Islands, the other south of New Guinea and eastward by way of the New Hebrides and Fiji. Upon the first Polynesian colonies a second migration several centuries later brought a horde of slightly more advanced members of their own race, the course of this later migration not yet identified before it appears in Samoa. As a result of the commotion caused by this later folk movement migration was resumed and the eastern groups were settled by swarms from Samoa as a point of distribution. The Samoans have always been noted as sailors and boat builders. They are famous for their legends and tales. Though they have all become nominal Christians, the European and American colonization has not been altogether to their benefit. In matter of population they seem to be about holding their own. Beneath the acquired new religion and borrowed culture survive many old traits and habits.

History. The Samoan Islands are probably

Longitude East from Greenwich
GUAM.
(TO UNITED STATES.)
Scale of Miles.
Pt. Ritidion
Pt. de Nigo
Falcona Anchorage
Patay N. Pt.
Patay E. Pt.
Sta. Rosa Pk.
Pt. de los Amantes
Taman Bay
Gualon
Pt. Honoum
Agaña Bay
Agaña
Pt. Sassayan
Apapa or Cabras I.
Lumlihan Reefs
Calalian Bank
Oroté I.
Assan
Tépungan
Gon I.
Mt. Tinkio
Pt. Orote
Orote Peninsula
Landing Place
St. Luis d'Apra
Pago
Port Pago
Ylic
Ylic Bay
GUAM
PACIFIC OCEAN
Pt. Facpi
Saga
Cetti
Fouha
Umata Bay
Umata
Ynarajan
Port Yarajan
Port Tarafofo
Agfayan Bay
Merizo
Port Merizo
Cocos I.
Pt. Ajayan.
PAGO PAGO HARBOR.
Tutuila I.
Scale of Miles
ONE MILE
Pago Pago Harbor
Grampus Rk.
Leava Pk.
Laulu
Breaker Pt.
Pt. Distress
Tower Rock
Coral Reef
Massacre Bay
Pagopago Harbor
Aitutaki Bay
Pago Pago
Fangalii
Euligasar
Oufonu Harbor
Massefau Bay
Cape Mututulu
Aloo
Red Pt.
Anuu
Nafanua Bank
Narragansett Passage
Halmer Bay
Pelon
Amanlula
Vailoa
Leone Bay
Rocky Pt.
Sail Rock Pt.
Steps Pt.
Tsema Bank
TUTUILA I.
(To United States.)
Scale of Miles.
SAMOA.
Scale of Miles.
Fetlupo
Matautu Harbor
SAVAII
Asau
Safotu
Palauli
Apolima
Manono
Salaufau
Safata Harbor
Faleolo Bay
Nuutele
Apia
Aana Bay
Tuamasaga
Aleipata
Leusoalii Bay
TUTUILA
Ofu
MANUA IS.
Pago Pago Harbor
Olosenga
Tau
(New Zealand)
(To United States)
ROSE I.
ARCTIC CIRCLE
ARCTIC OCEAN
SIBERIA
ASIA
ALASKA
Nome
Dawson
DOMINION OF CANADA
Bering Sea
Sitka
Dutch Harbor
JAPAN
PACIFIC OCEAN
AMERICA
Peking
KOREA
Port Arthur (Jap.)
Chefoo
Tsing-tau (Br.)
Kiao-chau
CHINA
Shanghai
Tokio
San Francisco
UNITED STATES
Washington
New York
(To United States)
Sebastian I.
TROPIC OF CANCER
Marcus I.
Honolulu
Hawaii
Hongkong
Ladrone Is. (Jap.)
Wake I.
Philippine Islands
Manila
Guam I.
Marshall Is. (Jap.)
Johnston I. (Br.)
Tampa
Gulf of Mexico
Havana
Cuba
Porto Rico
ATLANTIC OCEAN
Caroline Is. (Jap.)
Baker I. (U.S.)
EQUATOR
Borneo
Gilbert Is. (Br.)
New Guinea
Samoa Is. (N. Z.)
Tonga Is. (U.S.)
SOUTH AMERICA
UNITED STATES AND DEPENDENT TERRITORIES.
NOTE.—The total distance from San Francisco to Manila, via Hawaii and Guam, is 8,100 Miles.
Scale along the Equator.
THE M.-N. CO.
Longitude East from Greenwich
Longitude West from Greenwich

identical with the Baumann's Islands, discovered by the Dutch navigator Roggoveen in 1722. In 1768 Bougainville gave the name of Navigators Islands to the group. Christianity was introduced by John Williams in 1830. The various islands were ruled by independent chiefs, who acknowledged, however, the nominal authority of a king elected from one of the noble families. After 1868 the islands became subject to continual disturbances, owing to the struggle between rival candidates for the throne. These dissensions were fostered by the representatives of the three foreign Powers possessing considerable interests in Samoa—Germany, Great Britain, and the United States. In 1888 interests hostile to the Germans brought about the election of Mataafa as opposition King to Tamasese, and civil war broke out. Mataafa made himself master of Apia and in December defeated a small force of German marines. The German consul's truculent action nearly brought on war between the Powers, but a conference was finally called to adjust the difficulties. The Act of Berlin (June 14, 1889) proclaimed the independence and neutrality of the islands and guaranteed the natives full liberty in the election of their King. The interests of the Europeans were to be protected by the creation of a Supreme Court, consisting of a Chief Justice, and the erection of Apia into a municipality, the president of which, as well as the Chief Justice, was to be nominated by the three Powers. In 1898 King Malietoa Laupepa died, and Mataafa was elected his successor by an overwhelming majority of the people. The election was contested by Malietoa Tanu, a nephew of the dead King, who was declared by Chief Justice Chambers, an American, rightful King. Fighting thereupon ensued between the forces of Malietoa and Mataafa, who now enjoyed German support. The latter was victorious and in January, 1899, was recognized as provisional ruler of the islands. In March the United States man-of-war *Philadelphia* arrived at Apia. Rear Admiral Kautz, after conferring with the representatives of the other Powers, refused to lend further recognition to the Government of Mataafa. The German Consul issued a proclamation in favor of Mataafa, who accordingly maintained his attitude of resistance. On March 15 the villages around Apia were bombarded by the British and American ships. Germany again showed herself conciliatory, and by the agreement of Dec. 2, 1899, between Germany, Great Britain, and the United States, the Samoan Islands were partitioned between Germany and the United States. Great Britain received the Solomon and Tonga Islands. On March 16, 1889, a hurricane destroyed the American and German fleets in Apia roadstead. Of the American vessels, the *Trenton* and the *Vandalia* were sunk, the loss being 52 officers and men. Two German vessels were destroyed, with a loss of 130 men. In August, 1905, after a period of quiescence so long that the tradition of volcanic activity had nearly passed from memory, a cone opened in one of the interior valleys of Savaii. The lava filled the central and lateral valleys and then broke forth in a stream towards the north coast with a flow which in a single one of the exits to the sea exceeded 7000 tons of molten matter a minute. The eruption of the newly formed volcano, Maunga-afi, continued for four years without abatement, and the discharge has been estimated at more than 5 cubic miles of lava. After a brief resting period in which the crater sealed itself by cooling of the magma, Maunga-afi blew off its top with a violent explosion, and the lava again reached the north coast. These two eruptions exceed in the amount of lava extruded all eruptions in the world within the period of human history. In 1909 three German warships were sent to Samoa to put down a native uprising caused by discontent with German control. In the wide-spread war which began in 1914 German Samoa was captured by an expeditionary force from New Zealand. See WAR IN EUROPE. Consult: R. L. Stevenson, *A Footnote to History* (London, 1892); A. P. C. Griffin (comp.), *List of Books on Samoa and Guam*, published by the United States Library of Congress (Washington, 1901); J. B. Henderson, *American Diplomatic Questions* (New York, 1901); R. L. Stevenson, *Letters from Samoa, 1891–5* (ib., 1906); George Brown, *Melanesians and Polynesians* (ib., 1910); John La Farge, *Reminiscences of the South Seas* (ib., 1912).

SA'MOS (Lat., from Gk. Σάμος; Turk. *Susam Adassi*). An island off Asia Minor, separated by a strait (called by the Turks Little Boghaz), 1 mile wide, from the promontory of Mycale (q.v.), of which its mountains are a prolongation (Map: Greece, H 6). Its length is about 30 miles, its mean breadth about 8 miles; area, 181 square miles. A range of mountains runs through the island, attaining its greatest height, 4725 feet, at the west, in Mount Kerkis (the ancient Cerceteus). Samos is still, as in ancient times, well wooded. Though mountainous towards the north and west, the east and south contain fertile and well-watered ground, and the island exports quantities of grapes, wine, oil, carob beans, and hides; its mountains furnish quarries of marble, and zinc, lead, iron ore, emery, lodestone, and ochre are to be found, but there is little mining. The city of Samos was in the southeastern part, near the modern Tigani, where can still be seen the remains of the great moles of the harbor, the ancient fortifications, and the aqueduct cut through the mountain for Polycrates (q.v.) by Eupalinos. About 4 miles away was the celebrated Heræum, or temple of Hera, one of the largest Greek temples known to Herodotus; of this only scanty remains are now visible. Excavations begun in 1902 by the Greek Archæological Society have shown that it had two rows of Ionic columns on the sides and three at the ends and that its dimensions were 54.5 by 109 meters. On the north coast lies the modern capital, Vathy, which derives its name from its deep (Gk. *βαθύς, bathys*, deep) harbor. Pop., in 1896, 49,733; in 1914, according to Baedeker, it was 65,000, mostly Greeks.

The early Greek settlers were said to have come from Epidaurus (q.v.), and the worship on the island of Hera (see JUNO) certainly points to a connection with Argolis. In the early history of the Ionic Confederation Samos seems to have held a prominent place. The inhabitants were bold seamen and built up a large commerce with Asia Minor, the Black Sea, Egypt, and the West. Its greatest splendor was reached under Polycrates (q.v.). After his death the island suffered severely from civil strife and from the Persians. In 479 B.C. it joined the Greeks and became a member of the League of Delos (q.v.) and later a free ally of Athens. A revolt in 440 B.C. led to its reduc-

tion to the position of a vassal of Athens, but it received renewed privileges in the later years of the Peloponnesian War, when it proved a faithful ally of the Athenian democracy and was the headquarters for the Athenian fleet. After the fall of Athens it was occupied by Lysander (q.v.), who established an oligarchical government. By the Peace of Antalcidas (q.v.) in 387 B.C. the island passed into the possession of Persia. In 365 B.C. it was again conquered by the Athenians, who expelled the inhabitants and sent thither a body of Athenian cleruchs (see COLONY), who remained in possession till driven out by Perdiccas after the death of Alexander the Great. From this time the island appears but seldom in history. It sided with Antiochus and Mithridates against Rome and in 84 B.C. was joined to the Province of Asia. Under the Byzantine emperors it was of some importance. In 1550 it passed into the hands of the Turks. When the War of the Greek Revolution broke out, there were no more ardent and devoted patriots than the Samians, and deep was their disappointment when, at the close of the struggle, European policy assigned them to their former masters. The island, however, was placed in a semi-independent position in 1832, when it was constituted as a tributary principality, under a Prince of Samos, who is a Greek Christian appointed by the Sultan, and a national council, of Greeks, which regulates the assessment of the tribute to the Turks and the internal affairs of the island. The annual tribute amounts to 300,000 piastres. Under this government the island has rapidly increased in population and enjoys a thriving trade.

Bibliography. Theodor Panofka, *Res Samiorum* (Berlin, 1822); H. V. Guérin, *Description de l'île de Patmos et de Samos* (Paris, 1856); Fabricius, in *Mittheilungen des archäologischen Instituts* (Athens, 1884), on the aqueduct of Eupalinos; H. F. Tozer, *Islands of the Ægean* (Oxford, 1890); K. Baedeker, *Konstantinopel, Balkanstaaten, Kleinasien, Archipel, Cypern*, 420–426 (2d ed., Leipzig, 1914), with plan of the ancient city of Samos and of the Temple of Hera; and the article "Samos," in Friedrich Lübker, *Reallexikon des klassischen Altertums*, vol. ii (8th ed., ib., 1914).

SAMOS, CONON OF. See CONON OF SAMOS.

SAMOS, DURIS OF. See DURIS OF SAMOS.

SAMOSA'TA. The ancient name of Samsat (q.v.).

SAMOSATA, PAUL OF. See PAUL OF SAMOSATA.

SAM'OTHE'RIUM (Neo-Lat., from Gk. Σάμος, *Samos*, Samos + θηρίον, *thērion*, dim. of θήρ, *thēr*, wild beast). An extinct giraffe, found fossil in Pliocene deposits of the island of Samos in the Turkish archipelago. See SIVATHERIUM.

SAM'OTHRACE (Lat., from Gk. Σαμοθράκη, *Samothrakē*), or THRACIAN SAMOS. An island in the Ægean, northeast of Lemnos (*Stalimene*) (Map: Greece, Ancient, D 1). It belongs to Turkey. It is a rugged and mountainous mass, about 8 miles long by 6 broad. Its principal summit (5240 feet) is the highest point in the Greek archipelago. From it, according to the *Iliad* (xiii, 12), Poseidon watched the battles around Troy, and, in spite of the intervening island of Imbros, the Trojan plain can be seen from the top of this mountain in Samothrace. During classical times the island plays no part in history, except as the chief seat of the mysteries of the Cabeiri (q.v.). In 1457 it was occupied by the Turks. An attempt to join in the Greek revolution led, in September, 1821, to a savage massacre of the scanty population. At present the island contains but one town of any size, Chosa or Chora. The ancient town can still be identified by its fortifications, and the site of the ancient temples has been carefully explored. The first excavators in 1863 and 1867 were French, and their great prize was the superb Nike of Samothrace, now in the Louvre, a very fine example of the Attic school of the end of the fourth century. More important was the thorough clearing of the sanctuary in 1873–75 by the Austrians. Consult: A. C. L. Conze, *Reise auf den Inseln des thrakischen Meeres* (Hanover, 1860); Conze, Hauser, and Niemann, *Untersuchungen auf Samothrake* (Vienna, 1875); Conze, Humann, and Benndorf, *Neue Untersuchungen auf Samothrake* (ib., 1880); A. F. Tozer, *Islands of the Ægean* (Oxford, 1890). For the Nike, consult E. A. Gardner, *A Handbook of Greek Sculpture* (London, 1911); H. H. Powers, *The Message of Greek Art* (New York, 1913); and see illustration 6 on the Plate REPRESENTATIVE WORKS with the article GREEK ART.

SAM'OVAR, *Russ. pron.* sä-mô-vär', i.e., self-boiler. A tea urn, much used in Russia, made generally of brass and so constructed that water can readily be boiled and kept hot by means of live charcoal inclosed in a central tube. Placed on the dining table, it is especially advantageous in a country where tea is the national beverage.

SAMOYEDS, sä'mô-yĕds. A branch of the Finno-Ugrian (Finnic) section of the Ural-Altaic stock of the Mongolian race, inhabiting the tundras of northeastern Europe and Siberia. As Samoyed peoples are usually reckoned the following: Yurak, nomads of the tundras of the Arctic Ocean from the European limit of the Samoyeds to the Asiatic (Yenesei); Tawgy, east of the Yurak to Khatanga Bay; Yeneseian Samoyeds, on the tundras of the lower Yenesei, between the Yurak and the Tawgy; the so-called Ostyak-Samoyeds of the wooded country on the Obi and its tributaries between Tym and Tchulym; the Soyotes of the Sayan mountain country, etc.; the Mators, on the river Tuba, north of the Sayan Mountains; the Koibals, on the upper Yenesei; the Karagass, on the Uda in the Sayan country; the Kamassinz, about Abakansk and Kansk, between the Angara and the Yenesei. The Yurak and Tawgy are reindeer nomads chiefly, the Ostyak-Samoyeds fishers and hunters for the most part, the Yeneseian Samoyeds partly reindeer nomads, partly hunters and fishers. The nomadic Samoyeds are tent dwellers, the others live in huts known as yurts. The Samoyeds are strongly Mongoloid in physical type, with short stature, brachycephalic head, oblique eyes, and straight hair. Their culture, except where Russian and Chinese influence is felt, is comparatively primitive. There is evidence that they once occupied a much greater territory than at present, particularly to the south, but were driven back by Tatar invasions. The number of the Samoyeds is estimated at about 17,000, of whom about one-third live in European Russia. Consult: M. A. Castrén, *Ethnologische Vorlesungen über die altaischen Völker* (St. Petersburg, 1857); Pauly, *Description ethnographique des peuples de la Russie* (ib., 1862); F. G. Jackson, *Great Frozen Land* (London, 1895). See SOYOTS.

SAM'PHIRE (*Crithmum*). A genus of plants of the family Umbelliferæ. Common samphire (*Crithmum maritimum*), a perennial, 1½ feet high, is a native of the Mediterranean region of Europe, growing chiefly on rocky cliffs near the sea. It is used in pickles and salads for its piquant, aromatic taste. It is easily cultivated in ordinary garden soil. Golden samphire (*Inula crithmoides*), of the family Compositæ, is similarly used. The name samphire is applied in the United States to some of the species of *Salicornia*.

SAMPLING OF ORE. See Assaying.

SAMP'SON, William Thomas (1840–1902). An American naval officer, born Feb. 9, 1840, at Palmyra, N. Y. He graduated at the United States Naval Academy in 1861 and during the following three years was an instructor at the academy. In June, 1864, he became executive officer of the ironclad *Patapsco* of the Charleston blockading squadron and was on board when that vessel was destroyed by a submarine torpedo, although he himself escaped unhurt. The 10 years immediately after the Civil War were spent by him partly at sea and partly as an instructor at the Naval Academy. From 1879 to 1882 he commanded the *Swatara* on the Asiatic Station, was then for a period in charge of the Naval Observatory, and from 1886 to 1890 was superintendent of the Naval Academy, which under his direction reached a higher standard of efficiency than ever before. When, in 1890, the *San Francisco*, the first modern steel cruiser of the new navy, was put in commission, Sampson, who had reached the grade of captain in the preceding year, was assigned to her command, retaining it until 1892. From January, 1893, until May, 1897, he was chief of the Bureau of Ordnance, played a conspicuous part in the building up of the new navy, and came to be recognized as one of the world's greatest authorities on ordnance. To him more than to any one else was due the adoption of the superimposed turret. After the destruction of the battleship *Maine* in Havana harbor on Feb. 15, 1898, he was appointed president of the naval court of inquiry to investigate the occurrence. Soon afterward Sampson was appointed, as acting rear admiral, to the command of the North Atlantic squadron. He attained the rank of commodore in regular line of promotion on July 3, 1898. On the same day Admiral Cervera's Spanish squadron was destroyed off Santiago by the ships under Sampson's command. After the engagement of July 2 General Shafter regarded the army's position as untenable and requested Admiral Sampson to confer with him as soon as possible. On the morning of July 3, about an hour before the Spanish ships were sighted coming out, Sampson started eastward to meet Shafter, intending to land at a point 5 or 6 miles from his usual blockading position. Just after disembarking from his flagship (the *New York*), the first firing at the Spanish ships was seen and heard. Sampson hastily returned on board and started to rejoin his squadron, but before he arrived within battle range three of the Spanish ships had been driven ashore. He continued, in company with the *Brooklyn*, *Oregon*, and *Texas*, in chase of the *Colón*, which was overhauled and surrendered about two hours and a half later. The battle was fought upon the plans devised by Sampson, and, although out of range, he was within signal distance of his nearer ships during the greater part of the time. No signals were necessary, however, and he made none, nor did Commodore Schley. After the war he served as a Cuban commissioner, was promoted rear admiral on March 3, 1899, and until September, 1901, was in command of the Boston (Charlestown) Navy Yard. He was retired from active service Feb. 9, 1902, and died May 6 of that year. The closing years of his life had been clouded by the controversy between his friends and the supporters of Admiral Schley over the question of the command of the fleet during the battle of Santiago, the friends of the latter asserting that in Sampson's absence the credit of the victory belonged to Schley (q.v.).

SAMSAT, säm'sât, ancient **SAMOSATA.** A village in the Vilayet of Aleppo, Asiatic Turkey, on the right bank of the Euphrates, 130 miles northeast of Aleppo. It was the ancient capital of the Syrian Kingdom of Commagene. The place is inhabited by Kurds. From this town, according to Strabo, the ancient road started to India. Hittite and Greek inscriptions are found in its vicinity.

SAMSHUI, sâm'shōō'ē (Chin., three waters). A hien or prefectural city and open port of China, in the Province of Kwangtung, situated about 30 miles west-northwest of Canton at the point where the Si-kiang, or West River, joins the Pe-kiang, or North River, to form the Chu-kiang, or Pearl River, on which Canton is situated. The city itself, which has a population of about 50,000, stands about ½ mile back from the river bank and is in a state of semidecay. It was opened to foreign trade in 1897 in accordance with a treaty made earlier in the year with Great Britain. The native junk trade is immense, and there is a considerable native canning industry here of rice birds, soles, quail, etc. In 1912 the total trade amounted to 1,734,896 haikwan taels (haikwan tael = $0.74).

SAMSKARA, sâms-kä'râ (Skt., completion). The name of the 40 essential rites of the first three castes of Hindus. They are the ceremonies to be performed at the procreation of a child, the parting of the mother's hair in the sixth or eighth month of her pregnancy to cause the infant to be a male, on the birth of the child before dividing the navel string, the ceremony of naming the child on the tenth or twelfth day, feeding him with rice in the sixth month, the tonsure in the third year, investiture with the Brahmanical cord in the fifth, eighth, or sixteenth year, when he is intrusted to a guru (q.v.) to receive his religious education, the four vows on beginning the study of the Vedas, the ritual bath and return home on the completion of the course, marriage, the five great offerings, the seven small offerings, the seven libations to the fire, and the seven soma sacrifices. Other texts make certain additions to this list. Consult Julius Jolly, *Recht und Sitte* (Strassburg, 1896), and Alfred Hillebrandt, *Ritual-Litteratur* (ib., 1897).

SAM'SON (Heb. *Shimshōn*, from *Shemesh*, sun). An early Hebrew hero whose story is found in the Book of Judges, chaps. xiii–xvi. It is stated that he was the son of Manoah of Zorah, of the tribe of Dan. Manoah's wife was barren, but an angel appeared to her and promised a son, who should be a Nazarite, i.e., a consecrated one. The angel appears a second time at Manoah's prayer and repeats his instructions. No razor is to touch the boy's head.

The child is born, and his hair endows him with a supernatural strength. His first feat is his tearing a lion when on his way to ask a Philistine woman in marriage. Returning the same road to celebrate his wedding, he finds a swarm of bees in the lion's carcass, and from this propounds a riddle which, through his wife's treachery, cost 30 Philistines their lives. He leaves his wife for a while and on returning to her finds that she has been given in marriage to another. In revenge he burns the fields of the Philistines by letting loose into them 300 foxes, to whose tails he has attached firebrands. The Philistines in retaliation burn his wife and her house, and Samson avenges this deed by a great slaughter. He escapes to Judæan territory, but allows himself to be handed over to the Philistines. By means of his strength he burst the ropes with which he was tied and, obtaining the jawbone of an ass, kills 1000 Philistines. Betrayed by a harlot at Gaza, Samson's next deed consists in carrying the doors of the city gates with the posts and bars to the top of a mountain at Hebron. Finally in the valley of Sorek he is betrayed by his paramour, Delilah, to whom he reveals that the source of his strength is his hair. While he is asleep Delilah causes his locks to be shorn and hands him over to the Philistines. His eyes are put out and he is forced to perform servile labor. His hair, however, grows again, and on the occasion of a festival at which Samson is exhibited as a spectacle to the people he pulls down the pillars of the house in which the Philistines had assembled, burying the multitude with himself in the ruins. The narrative ends with the statement that he judged Israel for twenty years.

The story appears to show some traces of editorial revision. Its legendary or even mythical character seems to many scholars obvious. The meaning of the name (the sunny one) and the nature of some of the exploits have suggested that Samson was originally a solar hero. Others have surmised that there may be a historical background and that it reflects some actual episode in the struggle between the Danites and the Philistines before the emigration of the tribe of Dan to the extreme north (see DAN) or among a possible remnant that did not participate in this emigration. The Nazarites (q.v.), as they were conceived of in later times, are men of a type quite different from Samson, but an earlier age may have associated with the term different conceptions. Consult J. G. Frazer, *The Golden Bough: A Study in Magic and Religion*, vols. i–iii (3d ed., London, 1911). For the Samson story in general: the commentaries on Judges by Moore, Budde, Nowack, and Bertheau; Doorninck, "De Simsonsage," in *Theologisch Tijdschrift*, vol. xxviii (Leyden, 1894). For the mythological interpretation: Ignaz Goldziher, *Der Mythos bei den Hebräern* (Leipzig, 1876; Eng. trans., London, 1877); Steinthal, "Die Sage vom Simson," in *Zeitschrift für Völkerpsychologie*, vol. ii (Berlin, 1861); Paul Carus, *The Story of Samson and its Place in the Religious Development of Mankind* (Chicago, 1907); also H. Gunkel, "Simson," in *Die Religion in Geschichte und Gegenwart* (Tübingen, 1913).

SAMSON, GEORGE ALEXANDER GIBB. See ALEXANDER, SIR GEORGE.

SAMSON, säN'sôN', JOSEPH ISIDORE (1793–1871). A French actor, born at Saint-Denis. He studied at the Conservatoire and, after playing in the provinces, was engaged at the Odéon Theatre of Paris in 1819. From 1826 until 1863 he played at the Comédie Française, where he created more than 250 rôles. After 1829 Samson was professor at the Conservatoire. He was the author of several comedies, which included *La belle-mère et le gendre* (1826; 2d ed., 1880) and *La famille poisson* (1846).

SAM'SON AGONISTES, ăg'ô-nĭs'tēz. A dramatic poem by Milton (1671). The final triumph of the blind champion of Israel over his enemies, the Philistines, is told in the form of the Greek drama. Handel composed an oratorio *Samson* (1743), with a libretto arranged from the poem.

SAMSON ET DALILA, säN'sôN' ā dà'lē'là'. An opera by Saint-Saëns (q.v.), first produced in Weimar, Dec. 2, 1877; in the United States, Jan. 4, 1893 (New Orleans).

SAMSUN, säm-sōōn' (Lat. *Amisus*, from Gk. *Ἀμισός*). An important seaport in the Vilayet of Trebizond, Asiatic Turkey, situated on the south coast of the Black Sea, about 90 miles southeast of Sinub (Sinope) (Map: Turkey in Asia, C 2). It is badly built and unhealthful. The chief imports are various manufactures, and the exports consist mainly of cereals, flour, and tobacco. Its population is estimated at 11,000, about half of which consists of Greeks. The ancient town of Amisus, which was 1½ miles northwest, was an important Greek settlement.

SÁMUCAN, sä'mōō-kan. A linguistic stock of Argentina. The Sumacus (Zamucus) embrace a number of subtribes dwelling on the northern border of the Chaco, between lat. 18° and 20° S. and about the river Axuquis. They dwelt in fixed villages and pursued an agricultural life. D'Orbigny called their language the Italian of the forest. Consult: D. G. Brinton, *The American Race* (New York, 1891); Huonder, in *Globus*, vol. lxxxi (Brunswick, 1902); Kersten, in *Internationales Archiv für Ethnographie*, vol. xvii (Leyden, 1904).

SAM'UEL (Heb. *Shĕmū' ēl*, name of God, perhaps in the sense of son of God). The son of Elkanah and Hannah, a judge and prophet, who plays a prominent part in Hebrew history just prior to the establishment of the monarchy in the eleventh century B.C. The story of Samuel is told in the first of the two books of the Old Testament which bear his name. Modern scholars who think that these books are a compilation find each of the two sources in the account given of Samuel. (See SAMUEL, BOOKS OF.) In the older narrative he is represented as a seer, attached to a town in the hill country of Ephraim, who is consulted by Saul while in search of the lost asses of his father (chap. ix). Samuel, who has been informed by Yahwe of Saul's coming, receives him cordially and invites him to a sacrificial meal. On the following morning he announces to Saul that Yahwe has designed him to be the deliverer of the Hebrews from the oppression of the Philistines and privately anoints him. Three signs are given to Saul by means of which to test the truth of Samuel's words. The signs are fulfilled and soon the occasion presents itself which enables Saul to raise the siege of Jabesh-Gilead, and amid much enthusiasm he is crowned king. The later narrative is not only much fuller, but accords to Samuel the preëminent position that he occupies in

biblical tradition. It begins with the vow made by Hannah, the barren wife of Elkanah, on the occasion of a visit to the sanctuary at Shiloh, to devote the child that is promised to her through Eli to the service of Yahwe. Samuel is born and after being weaned is handed over to the care of Eli. While engaged in the service of the sanctuary Yahwe appears to him in the night and announces the approaching downfall of the house of Eli in consequence of the sins committed by the wicked sons of the priest. The defeat of the Israelites by the Philistines at Aphek seems to be the catastrophe meant by the prophecy, though in connection with this event and the subsequent restoration of the ark there is no mention of Samuel. When Samuel next appears he has assumed the rôle of a general adviser to whom the people look for advice; he exhorts them to turn from their idolatrous practices, and his intercession with Yahwe brings about the discomfiture of the Philistines. Samuel, moreover, is portrayed as a judge administering justice throughout Israel through a yearly circuit which embraced the chief sanctuaries, Bethel, Gilgal, and Mizpah. On the approach of old age Samuel associates his two sons with him, but the latter, like the sons of Eli, did not resemble their father. For this reason and because they wanted to be like other nations, the people demand that a king be set over them. Samuel at first opposes the request, which he regards as an act of rebellion against Yahwe, but finally yields and at a gathering of the people in Mizpah directs that lots be cast for the king. The choice falls on Saul, the son of Kish, the Benjaminite. A farewell speech practically closes the public career of Samuel, who, however, lives long enough to announce to Saul that the kingdom will be taken from him because of his disobedience to Yahwe's command. (See SAUL.) He anoints David and after that retires from public gaze. He dies at Ramah and is buried there.

Bearing in mind the general religious character of the later narrative (as set forth in the article SAMUEL, BOOKS OF), it is not surprising to find incidents introduced which are intended to illustrate the narrator's conception of Israel's past. So the opposition of Samuel to the kingdom is supposed by some scholars to reflect the general view of a later period which looks with disfavor upon the whole period of royalty and regards its institution as the fatal step in Israel's history. The scene, therefore, between Samuel and the people in which he rebukes them for desiring a king (1 Sam. viii. 10–18) may contain but a slight historical kernel or even be a purely fanciful elaboration. In like manner many scholars regard the farewell speech of Samuel (1 Sam. xii) as unhistorical and believe that legendary embellishments form a factor in many of the other incidents related of him. Nevertheless they agree that the narrative correctly estimates the importance of the position held by Samuel and the scope of his influence. Consult: G. C. M. Douglas, *Samuel and his Age: A Study in the Constitutional History of Israel* (London, 1901); F. B. Meyer, *Samuel the Prophet* (new ed., New York, 1902); and the chapters on Samuel in the Hebrew histories of Stade, Wellhausen, Piepenbring, Guthe, and others.

SAMUEL, BOOKS OF. Two of the historical books of the Old Testament, counted by the Jews as belonging to the Latter Prophets. Originally they formed one work, but were divided into two books in the Greek version and the Latin Vulgate, and the same division has been made by Hebrew editors since Bomberg. In the Greek translation they are called the First and Second Books of Reigns, and in the Vulgate 1 and 2 Kings. According to *Baba bathra*, 14 b, "Samuel wrote his book," but, as most of the work deals with the history subsequent to this prophet's death, this tradition has not been strongly urged, and it is evident that the name is simply taken from the principal figure in the opening chapters. The books begin with the high priesthood of Eli and close with the death of David. Four main divisions may be noted: (1) the establishment of the monarchy by Samuel (1, i–xv); (2) the narrative of Saul and David and the history of Saul's reign to his death (1, xvi–2, viii); (3) David's reign (2, ix–xx); (4) an appendix (2, xxi–xxiv).

In the opinion of some modern critics the books are a compilation of several documents more or less skillfully pieced together, with editorial comment and additions revealing the point of view from which the compiler or compilers regarded the past. The compilatory hypothesis seeks to account for alleged duplication of incidents, contradictions, and inconsistencies in the work as its stands. For example, it is believed that we have two accounts of the choice of Saul as king, two versions of David's introduction to Saul, two narratives of the death of Saul; little effort seems to have been made to harmonize the chief sources at the disposal of the compiler; the older is characterized by its graphic style and by the simple, straightforward manner in which events are narrated, the younger by the introduction of religious views which reflect the standards of a later age and by judgment of events according to those standards. The older narrative is assigned by these scholars approximately to the ninth century B.C., the later to the eighth century. The first combination of the two sources by a redaction is supposed to have taken place in the seventh century, before the reforms instituted by Josiah (620 B.C.), but it is thought that in the present form of the two books we may detect a subsequent recension made with the view of bringing the narrative into accord with the religious standpoint of Deuteronomy. It is assumed that this was done mainly by the addition of summaries at the end of important sections and by the expansion of certain incidents which lent themselves to a homiletical sentiment. Other additions are thought to have been made by a later school of editors of the fifth and fourth centuries B.C., while after the separation of the Books of Samuel from the Books of Kings the appendix (2 Sam. xxi–xxiv) was added to the former embodying miscellaneous fragments, and to this late period likewise the insertion of the psalm known as the Song of Hannah (1 Sam. ii. 1–10) is assigned.

Concerning the great importance of these books there can be no difference of opinion. It has long been recognized that 2 Sam. ix–xx is an exceedingly fine piece of historic writing, distinguished by its impartiality, sobriety, and skill in narration. It is generally held to be the work of a contemporary of David. That such a document could have been written at the beginning of the tenth century B.C. speaks very

highly of the historic sense of the Hebrews. While other sections may inspire less confidence, the work as a whole is of utmost value, as it deals with a period of Jewish history on which no light has yet been shed by Babylonian, Assyrian, or Egyptian inscriptions. Whatever may be thought as to the merits of this compilatory theory, there can be no question that the text has undergone many changes, especially by interpolations and additions, in course of transmission. To a limited extent these may be discovered by purely textual criticism, in which the Greek version has been of particular value.

Consult the commentaries of Klostermann (Munich, 1887), Thenius-Löhr (Leipzig, 1898), H. P. Smith, in *International Critical Commentary* (New York, 1899), Karl Budde (Tübingen, 1902), W. Nowack (Göttingen, 1902), A. R. S. Kennedy (London, 1905); the introductions to the Old Testament by S. R. Driver, Kuenen, Cornill, Bleek-Wellhausen, Kautzsch, Baudissin, Sellin; Julius Wellhausen, *Text der Bücher Samuelis* (Berlin, 1871); Karl Budde, *Richter und Samuel* (Giessen, 1890); Budde's text in the *Sacred Books of the Old Testament* (Leipzig, 1894); S. R. Driver, *Notes on the Hebrew Text of the Books of Samuel* (2d ed., Oxford, 1913). See David; Kings, Books of; Samuel; Saul.

SAMUEL, Herbert (Louis) (1870–). An English politician, born in Liverpool. He was educated at Balliol College, Oxford, and in 1895 and 1900 contested South Oxfordshire in the Liberal interest. In 1902 he was elected to the Commons for the Cleveland division of the North Riding of York. He was parliamentary Undersecretary of the Home Department in 1905–09, Chancellor of the Duchy of Lancaster with a seat in the cabinet in 1909–10, Postmaster-General in 1910–14, President of the Local Government Board from 1914 to June, 1915, and then, after the formation of the coalition cabinet, Postmaster-General again, but without a cabinet seat. Later in the same year he entered the cabinet as Chancellor of the Duchy of Lancaster. He wrote *Liberalism: Its Principles and Proposals* (1902). Consult A. G. Gardiner, *Prophets, Priests, and Kings* (London, 1908; New York, 1914).

SAMUEL, Judah ben. See Judah ben Samuel.

SAMUELS, Samuel (1823–1908). An American sea captain and yachtsman, born in Philadelphia. He went to sea as a cabin boy when only 11 years old and at the age of 21 had become a merchant captain. For many years he sailed the clipper *Dreadnaught*, one of the fastest and best known of American packets. He was captain of the U.S.S. *John Rice* in 1863–64 and commanded the *McClellan* at the taking of Fort Fisher in 1865. After winning a yacht race across the Atlantic Ocean in 1866 with James Gordon Bennett's *Henrietta*, he sailed in other races and won the last one with his own yacht, the *Dreadnaught*. Samuels is author of *From the Forecastle to the Cabin* (1887).

SAMUELSON, săm'ŭ-el-son, Sir Bernhard (1820–1905). A British ironmaster, born at Hamburg, Germany, where his mother was on a visit. In 1842 he became manager of the export business of Sharp, Stewart & Co. Six years later he purchased a small agricultural-implement factory at Banbury, and this he developed into a large industry. Becoming interested in the Cleveland (Yorkshire) iron trade in 1853, in 1887 he formed the ironworking firm of Sir B. Samuelson & Co., Ltd. The furnaces produced 300,000 tons of pig iron annually by 1905. From 1865 to 1895 Samuelson was a Liberal member of the House of Commons and in 1881 was elected a fellow of the Royal Society.

SAMURAI, să'mōō-rī' (Jap., guard). The military class in Japan during the feudal period, or a member of that class. Originally the term denoted the soldiers who guarded the Mikado's palace; later it was applied to the whole military system and included (1) the *shōgun*, or commander in chief; (2) the *daimyos*, or territorial nobles; and (3) the *samurais* proper, or their retainers, the privileged two-sword men, the fighting men, the gentlemen, and the scholars of the country. In 1868 the shogunate and in 1871 the whole feudal system were abolished; the daimyos returned their lands to the Emperor, and they and their retainers were granted pensions. The practice of wearing swords was prohibited. Finally in 1878 the names daimyo and samurai were changed to *kwazokŭ*, or nobility, and *shizokŭ*, or gentry, respectively. See Bushido; Daimyo. Consult Knapp, *Feudal and Modern Japan* (Boston, 1876), and E. J. Harrison, *Fighting Spirit of Japan* (New York, 1913).

SAMVAT, săm'vät (abbrev. form of Skt. *saṁvatsara*, year). The most important system of reckoning time in India. The era is in use in northern India generally except in Bengal. According to native tradition the Samvat year was introduced by King Vikrama (q.v.) in 58 B.C. A Samvat given date represents the year last completed. Consult Swell and Dikshit, *The Indian Calendar* (London, 1896), and R. Sewell, *Indian Chronography* (ib., 1912). See Śaka; Saptarshi.

SANA, or **SANAA,** sä-nä'. The capital of the Turkish Vilayet of Yemen, Arabia, situated in a beautiful valley at an altitude of 7300 feet (Map: Turkey in Asia, E 8). The old white-washed palace of the Imams, now the residence of the Turkish Governor, is a prominent feature. There are numerous mosques, public baths, and caravanserais. There is a flourishing trade in aloes, skins, coffee, indigo, and gum arabic. There are manufactures of carpets, arms, jewelry, silks, and cottons. Sana was taken by the Turks in 1872. Pop. (est.), 50,000.

SAN ANDRÉS TUXTLA, săn ăn-drās' tōōs'tlä. A town of the State of Vera Cruz, Mexico, 83 miles southeast of the city of that name and 16 miles from the Gulf coast (Map: Mexico, L 8). The town is situated in a fertile valley producing in abundance maize, sugar cane, cotton, coffee, and other tropical products. Pop., 1900, 8669.

SAN AN'GELO. A city and the county seat of Tom Green Co., Tex., 239 miles southwest of Fort Worth, on the forks of the Concho River, and on the Gulf, Colorado, and Santa Fe and the Kansas City, Mexico, and Orient railroads (Map: Texas, B 4). It is important chiefly as a shipping centre for a cattle-raising and farming district and has some manufactures. Sheep, wool, and pecans are articles of commerce. Pop., 1910, 10,321; 1915 (U. S. est.) 15,300.

SAN ANTONIO, săn ăn-tō'nĭ-ō. The largest city of Texas, situated 80 miles south by west of Austin, on the Southern Pacific, the International and Great Northern, the Missouri, Kansas, and Texas, the San Antonio and Aransas

Pass, the Gulf Shore, and the San Antonio, Uvalde, and Gulf railroads (Map: Texas, C 5). Altitude, 651 feet; average annual temperature 68° F., with a relative humidity of 65°, and an annual rainfall of 27.76 inches. There are 600 miles of streets (240 macadam, 75 paved). Various objects of interest include Fort Sam Houston (q.v.), second in size among the military posts of the United States; Breckenridge Park (200 acres), with a splendid bathing beach; and San Pedro Park (40 acres). The San Antonio River and San Pedro Creek flow through the central portion of the city and unite within its limits. The city hall, the courthouse, the Federal building, the Carnegie library, and the combined market house and convention hall are noteworthy. Of buildings of historic interest mention may be made of the famous Alamo (q.v.), San Fernando Cathedral, and, within easy reach of the river, ruins of four of the early Franciscan missions, dating from the period 1720–50.

As a resort for those afflicted with pulmonary diseases, the city has long been noted, and more recently has become favorably known for the curative properties of its hot mineral wells. In 1915 San Antonio had 350 manufacturing establishments, employing about 9000 persons. These include large breweries, flouring mills, oil mills, brick and tile companies, packing houses, oil refineries, machine shops, foundries, ironworks, and cement works. The wholesale houses control to a great extent the trade of southwest Texas and portions of north Mexico. The city is a leading live-stock, cotton, wool, and mohair market. Agricultural and live-stock interests are predominant.

The city is under the commission form of government, with mayor and four commissioners—of taxation, of parks and sanitation, of streets and public improvements, and of fire and police. The public schools are administered by a non-partisan board chosen at a special election. The assessed valuation of the city in 1915 was $105,482,065. Total disbursements for the fiscal year 1915 were $1,028,006, of which the chief subdivisions by departments were $183,014 for police, $181,311 for the fire department, and $565,000 for schools. A private corporation is paid annually about $45,000 for street lighting, and $45,000 is expended in like manner for water, the supply of which is obtained from 14 artesian wells, furnishing the 140 miles of mains with 50,000,000 gallons a day. There are also 20 other wells in the city, with a combined daily capacity of 45,000,000 gallons. The city has installed a system of 182 miles of sewers at a total cost of $1,000,000. There are 20 miles of storm sewers.

The first permanent settlement within the limits of the modern city occurred in 1718, although there is trustworthy evidence to the effect that settlers from Monterey occupied the site in 1715. In 1718 occurred the double founding of the mission of San Antonio de Valero and of the accompanying presidio of San Antonio de Bexar. These three colonizing elements—ranchmen, missionaries, and soldiers—were joined by a colony of 56 persons from the Canary Islands, who formed the first regular municipal organization in Texas, known as the villa of San Fernando de Bexar. In 1809 the villa was raised to the rank of a city. Three battles were fought here during the Gutiérrez-Magee filibustering expedition of 1813, because of which and of the succeeding proscription San Antonio lost nearly two-thirds of its population. Under Mexican rule its affairs were neglected. The villa was left to its own devices. Slowly American settlers drifted in. In 1835 the Texan patriot army under Austin invested the place, and on December 9, after a brilliant assault led by Milam, it capitulated. Here, on March 6, 1836, occurred the storming of the Alamo, when the entire garrison of that mission fortress after a desperate resistance was massacred by the Mexican dictator, Santa Anna. Among the slain were Travis (q.v.) and Bowie (q.v.). After the decisive battle of San Jacinto American pioneers pressed into the region, closely followed by the Germans in the next decade. In 1861 the city was a scene of the surrender of General Twiggs, of the Department of Texas, to the Committee of Safety appointed by the Secession Convention. In 1878 the first railroad reached the city, and since then its growth has been rapid. Pop., 1870, 12,226; 1880, 20,550; 1890, 37,673; 1910, 96,614; 1915 (Census Bureau estimate), 119,447; 1920, 161,379. Consult William Corner, *San Antonio de Bexar* (San Antonio, 1890), and the *Texas Historical Quarterly* (Austin, Tex., 1897 et seq.).

SAN ANTONIO DE LOS BANOS, dā lōs bä'nyōs. A town in the Province of La Habana, Cuba, situated on the Havana-Guanajay Railroad, 15 miles southwest of Havana (Map: Cuba, C 3). It is a summer resort and has mineral springs and baths. It is also noted for its tobacco. Pop., 1907, 9125.

SANAVIRONAN, sä'nà-vē-rō'nan. An Indian language in the District of Córdoba, Argentina. Consult A. F. Chamberlain in *Journal de la Société des Américanistes de Paris*, vol. vii (N. S., Paris, 1910).

SANBAL'LAT (Heb. *Sanballat*, from Bab. *Sin-uballit*, Sin [the moon god] gives life). An opponent of Nehemiah, Governor of Samaria in the reign of Artaxerxes I (465–425 B.C.). He is called "the Horonite," but it is not known with certainty what place this indicates. As his friends were Tobiah the Ammonite, and Geshem the Arab, it is not impossible that he was a native of Horonaim in southern Moab. From Nehemiah's memoirs we learn that Sanballat grieved when he heard of Nehemiah's arrival (ii. 10); that he was angry when the walls were repaired and planned an attack (iv. 7, 8); that he invited Nehemiah to a meeting in one of the villages of Ono, which Nehemiah refused to attend (vi. 2–4); that he sent a letter to Nehemiah in which he threatened to report what he had heard from Geshem and others, that the walls were being repaired as a preparation for rebellion and that prophets were appointed to proclaim Nehemiah as King (vi. 5–8); and that he hired Shemaiah, Noadiah the prophetess, and others to trouble the Governor of Jerusalem (vi. 10–14). While all this clearly reveals Nehemiah's suspicions and furnishes good ground for supposing that Sanballat feared the effect of the fortification of Jerusalem and was hostile to Nehemiah, it supplies no evidence of violence, bad faith, or falsehood on his part. Shemaiah's act may have been one of genuine friendship or of mistaken zeal. Sanballat had two sons, to whom the Jewish colony on the island of Elephantine made an appeal for help in 411 B.C. (See ELEPHANTINE PAPYRI.) This makes it certain that Sanballat and Nehemiah (q.v.) were servants of Artaxerxes I. Accord-

ing to Josephus (*Ant.*, xi, 7–8) Sanballat was sent as satrap to Samaria by Darius III Codomanus (336–330 B.C.). When his son-in-law, Manasseh, was driven away by Nehemiah, he promised to secure for him high-priestly power and dignity and to make him governor of all the territory he himself possessed if he would retain his daughter as his wife. As Sanballat was advanced in years, Manasseh expected to receive these favors from Darius. When, contrary to his expectations, Alexander proved stronger than Darius, Sanballat sent troops to aid him in the siege of Tyre and was permitted to build the temple on Gerizim and to instate his son-in-law as high priest, after which he died. As his sons were grown-up men and Johanan high priest 80 years before Alexander, Josephus seems to have mistakenly identified the unnamed son of Joiada in Neh. xiii. 28 with Manasseh, the first high priest on Mount Gerizim, and the Joddua who was high priest in Jerusalem at the time of Alexander with the son of Johanan, Joiada's brother (Neh. xxi. 22). See SAMARITANS.

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SAN BENEDETTO PO, sän bā'nā-dĕt'tō pō. A town in the Province of Mantua, Italy, near the Po, 12 miles southeast of Mantua. It has an eleventh-century Benedictine monastery with a church built in 1542, one of the finest Renaissance buildings in north Italy. Bricks and wine are manufactured. Pop. (commune), 1901, 10,700; 1911, 11,751 (town, 1705).

SAN BERNARDINO, săn bĕr'när-dē'nō. A city and the county seat of San Bernardino Co., Cal., 60 miles east of Los Angeles, on the southern Pacific, the Salt Lake Route, the Pacific Electric, and the Atchison, Topeka, and Santa Fe railroads (Map: California, H 8). The vicinity is noted for its beautiful scenery and healthful climate and for baths. There are a Carnegie library, fine Y. M. C. A. and high-school buildings, and a handsome courthouse. The city lies in the great California orange region, which raises, besides great quantities of citrus fruit, hay and alfalfa. There are mining and stock-raising interests. The shops of the Atchison, Topeka, and Santa Fe Railroad employ 1600 men. There are also lumber mills, a box factory, foundries, and machine shops. The city has adopted the commission form of government. San Bernardino was founded in 1851 by a company of Mormons. The city stands on or near the site of an abandoned mission of the same name. Pop., 1900, 6150; 1910, 12,779; 1914 (U. S. est.), 16,274; 1920, 18,721.

SAN BERNARDINO, STRAIT OF. One of the two principal passages through the Philippine Archipelago (Map: Philippine Islands, E 4). It separates the island of Samar from Luzon and is part of the route between Manila and the United States.

SAN BLAS, bläs. A seaport in the Territory of Tepic, Mexico, situated in an unhealthful locality on the Pacific coast, 140 miles southeast of Mazatlan (Map: Mexico, F 7). Though its harbor is but an open roadstead, it is a port of considerable commercial importance. In 1913 its exports amounted to $315,490 and consisted chiefly of silver, lumber, rice, coffee, and mescal. A railroad runs to Tepic and is being extended to Guadalajara. Pop., 1910, 3000. Formerly the town was an important city with a population of 20,000.

SAN BLAS, CAPE. See CAPE SAN BLAS.

SANBORN, săn'born, FRANKLIN BENJAMIN (1831–). An American journalist, author, and reformer. He was born at Hampton Falls, N. H., and graduated at Harvard in 1855. As secretary of the Massachusetts Kansas Committee he came into close touch with John Brown. From 1863 to 1867 Sanborn was an editor of the Boston *Commonwealth*, from 1867 to 1897 of the *Journal of Social Science*, and from 1868 to 1914 a correspondent of the Springfield *Republican*. He was one of the founders of, and closely identified with, the American Social Science Association, the National Prison Association, the National Conference of Charities, the Clarke School for the Deaf, the Massachusetts Infant Asylum, and the Concord (Mass.) School of Philosophy. In 1874–76 he was chairman of the Massachusetts State Board of Charities and in 1879–88 State Inspector of Charities. He lectured at Cornell, Smith, and Wellesley. Besides editing writings of Thoreau, Paul Jones, J. H. Payne, Mrs. Shelley, and T. L. Peacock, Sanborn published: *Thoreau* (1872); *John Brown* (1885); *Dr. S. G. Howe* (1891); *Alcott* (1893); *Emerson* (1895); *Dr. Earle* (1898); *Personality of Thoreau* (1902); *Personality of Emerson* (1903); *A History of New Hampshire* (1904); *Hawthorne* (1908); *Recollections of Seventy Years* (1909); *Final Life of Thoreau* (1914).

SANBORN, JOHN BENJAMIN (1826–1904). An American soldier, born at Epsom, N. H. He studied at Dartmouth College and in 1854 was admitted to the bar. On the outbreak of the Civil War, as adjutant general and quartermaster general of Minnesota, he organized the Minnesota troops and in 1862 became colonel of the Fourth Minnesota Volunteers. He took part in the battles of Corinth, Port Gibson, Raymond, Jackson, Champion's Hill, and in the Vicksburg siege, and was promoted to be brigadier general in 1863. Placed in command of the District of Southwestern Missouri in October, 1864, he fought a number of successful engagements and effected treaties with Indian tribes hitherto hostile. Later he served in the Minnesota House of Representatives and Senate.

SANBORN, KATE (in full, KATHERINE ABBOTT) (1839–). An American author, born at Hanover, N. H. She taught in Mary Institute, St. Louis, and in Packer Institute, Brooklyn, and for several years was professor of literature at Smith College. After 1856 she wrote much on literary and other subjects and after 1895 became known as a lecturer. She published *The Wit of Women* (1885); *The Vanity and Insanity of Genius* (1886); *Adopting an Abandoned Farm* (1891); *Abandoning an Adopted Farm* (1894); *My Literary Zoo*

(1896); *Tact and Other Essays* (1899); *Old Time Wall Papers* (1905; new ed., 1908); *Hunting Indians in a Taxi-Cab* (1911); *Memories and Anecdotes* (1915).

SANBORN, WALTER HENRY (1845–). An American judge, born at Epsom, N. H. Graduating from Dartmouth in 1867, he began to practice law three years later with his uncle, John B. Sanborn, at St. Paul, Minn. After 1892 he was United States circuit judge of the Eighth Judicial Circuit and in 1903 was presiding judge of the United States Circuit Court of Appeals of the Eighth Circuit. By him were conducted the important receiverships of the Union Pacific (1893–98), Chicago and Great Western (1908–09), and Frisco (1913–14) railroads. The Union Pacific receivership involved $260,000,000. Judge Sanborn also handed down far-reaching decisions in the Trans-Missouri Freight (1893), Standard Oil (1909), and Oklahoma Gas (1911) cases.

SAN CARLOS, sän kär'lôs. A town of the Province of Ñuble, Chile, 208 miles south of Santiago, with which city it has direct railway connection. The old town is irregularly built, but the newer portion above the railway station is much better constructed. Pop., 1907, 8499.

SAN CARLOS. A town of the State of Cojedes, Venezuela, 105 miles southwest of Carácas (Map: Venezuela, D 2). Pop., 1909 (est.), 17,963.

SAN CARLOS. A town of Luzon, Philippine Islands, in the Province of Pangasinan, situated about 10 miles southeast of Lingayén, near the Manila-Dagupan Railroad (Map: Philippine Islands, C 3). Pop., 1903, 27,166.

SAN CARLOS, ORDER OF. A Mexican order for women, founded in 1865 by Emperor Maximilian and extinguished at his death. The decoration was a green and white Latin cross bearing the image of St. Charles.

SAN CATALDO, kä-täl'dô. A town in the Province of Caltanissetta, Sicily, 4 miles by rail west-southwest of Caltanissetta (Map: Italy, D 6). It has a handsome church with relics of St. Cataldus. There are sulphur mines, oil refineries, and a trade in grain and fruit. Pop. (commune), 1901, 17,941; 1911, 18,090.

SÁNCHEZ COELLO, sän'châth kô-āl'yô, ALONSO. See COELLO, ALONSO SÁNCHEZ.

SANCHO PANZA, sän'kô pän'zä; *Sp. pron.* sän'chô pän'thä. The faithful peasant who accompanied Don Quixote as his squire in Cervantes' romance. Famous for his shrewd common sense, he serves as an admirable foil to the idealistic and romantic knight.

SANCHUNIATHON, sän'kû-nī'ä-thŏn, or **SANCHONIATHON** (Lat., from Gk. *Σαγχουνιάθων, Sanchouniathōn*). The reputed author of a Phœnician history of Phœnicia and Egypt, called *Φοινικικὰ ἱστορία*, or *Τὰ Φοινικικά*. Philo Herennius, of Byblus, a Greek writer (born c.64 A.D.), claims to have translated Sanchuniathon's history into his own tongue; but of this translation all is lost save a few fragments relating to mythology and cosmology, which have been preserved by Eusebius in his *Præparatio Evangelica*. According to Philo, Sanchuniathon lived during the reign of Semiramis, the mythical Queen of Assyria, and dedicated his book to Abibalus, King of Berytus. Athenæus, Theodoret, Porphyry, and Suidas, on the other hand, speak of him as an ancient Phœnician who lived "before the Trojan War." There is also a discrepancy between the various ancient writers respecting the number of books contained in the *Phoinikika*, whether eight or nine. The genuineness of the fragments ascribed to Sanchuniathon has been the subject of a prolonged discussion. At present most scholars deny the existence of a Phœnician writer by the name of Sanchuniathon and believe that Philo embodied in his work current traditions that belong to a relatively high antiquity and culled his information from various sources. While this may be true, and the mythical material has unquestionably received its present form in the Hellenistic age, the name, *Sakkunyathon*, is genuinely Phœnician, a literary activity at Beirut even in the Assyrian period can no longer be regarded as improbable, and the use by Philo of an ancient Phœnician document, or a Greek translation of it, is by no means inconceivable in view of the fact that early documents were obviously employed by Menander of Ephesus. A forgery purporting to contain Philo's complete translation of Sanchuniathon and to have been found at the convent of Santa Maria de Merinhao was published by Wagenfeld (Bremen, 1837) and translated into German (Lübeck, 1837). Consult, for the text: *Sanchuniathonis Fragmenta* (Leipzig, 1826); Müller, *Fragmenta Historiorum Græcorum* (Paris, 1848). There is an English translation in Cory, *Ancient Fragments* (London, 1876). For discussion of the problems involved, consult: F. C. Movers, *Die Phönizier* (2 vols., Bonn, 1841–50); Ernest Renan, *Mémoire sur Sanchuniathon* (Paris, 1858); W. W. von Baudissin, *Studien zur semitischen Religionsgeschichte* (Leipzig, 1876); Hugo Gressmann, "Sanchuniathon," in *Die Religion in Geschichte und Gegenwart* (Tübingen, 1913).

SAN CRISTÓBAL DE LAS CASAS, sän krĕs-tō'bal dā läs kä'säs. A town of Chiapas, Mexico, situated on the plateau forming the base of the Yucatan Peninsula, 6500 feet above the sea (Map: Mexico, N 9). It is surrounded by ruins of ancient Indian cities and is built on the site of one of these, Huizacatlán. It has a cathedral and was the residence of Bishop Las Casas, the famous defender of the Indians. Up to 1892 it was the capital of the state. Pop., 1910, 13,745.

SAN'CROFT, WILLIAM (1617–93). Archbishop of Canterbury, the most distinguished of the nonjurors (q.v.). He was born in Suffolk and educated in Emmanuel College, Cambridge. The restoration of Charles II brought Sancroft the post of chaplain to Cosin, Bishop of Durham. After several preferments he was made, in 1677, Archbishop of Canterbury. In 1688 James II committed him and six other bishops to the Tower for presenting a petition stating their reasons for refusing to read from their pulpits the Declaration of Indulgence (q.v.). When James asked Sancroft to sign a declaration expressing abhorrence of the Prince of Orange's invasion, he refused and afterward even concurred in an invitation to William of Orange to intervene in English affairs. His later attitude to William is to be explained by the fact that though he was in favor of declaring James incapable of ruling, and of appointing William *custos regni*, his oath of allegiance to James prevented him from supporting William as King. Accordingly, after the settlement, he refused, along with seven other bishops, to take the oath of allegiance to the government, in consequence of which he was suspended. Consult: Gilbert Burnet, *His-*

tory of my Own Time (Oxford, 1833); Thomas Lathbury, *History of the Non-Jurors* (London, 1845); Leopold von Ranke, *History of England, Principally in the Seventeenth Century* (Oxford, 1875).

SANC'TIFICA'TION (Lat. *sanctificatio*, from *sanctificare*, to make holy, from *sanctus*, holy + *facere*, to make). In theology, the process by which the Holy Spirit renews man in the divine image, destroying within him the power of evil, and quickening the life of holiness. In Catholic theology it is included in justification; in historical Protestant theology it follows justification and causes man to do good deeds and to continue in harmony with the will of God.

SANCTION, Pragmatic. See Pragmatic Sanction.

SANCTI-SPÍRITUS, sängk'tē-spē'rē-tus. A town in the Province of Santa Clara, Cuba, about 20 miles from the south coast of the island (Map: Cuba, F 5). It was founded by Diego Velázquez in 1514 and has an old church with a high tower dating from the foundation of the town. Its port is Tunas, with which it is connected by rail. Pop., 1907, 17,440.

SANC'TUARY. A sacred or consecrated place; sometimes applied specifically to a place which gives protection to those threatened by punishment or vengeance. See Asylum.

SANCTUARY CROSS. See Cross.

SANCY, sän'sē', Nicolas Harlay de (1546–1629). A French soldier and diplomat, born in Paris. He belonged to the younger branch of the great Protestant family of Harlay. He became a Catholic for a few months in 1572 in time to escape death in the Massacre of St. Bartholomew, but soon returned to the Huguenot faith. Subsequently he went to Switzerland to secure mercenaries for Henry III, pledging his own valuable jewels, among them the famous Sancy diamond. (See Diamond.) His devotion to the cause of Henry IV caused the latter to appoint him in 1589 Superintendent of Finances. Later he served as Ambassador to England and held high rank in the army. His second and final conversion to Catholicism, which his contemporaries charged to his ambition, was satirized by D'Aubigné in his *Confession de Sancy*.

SAND. A loose, incoherent mass of mineral materials in a finely granular condition, usually consisting of quartz, with a small proportion of mica, feldspar, magnetite, and other resistant minerals. It is the product of the chemical and mechanical disintegration of rocks under the influences of weathering and abrasion. When freshly formed the particles are usually angular and sharply pointed, becoming smaller and more rounded by attrition when blown about by the wind or transported by water. Sand is an important constituent of most soils and is extremely abundant as a surface deposit along the courses of rivers, on the shores of lakes and the sea, and in arid regions. See Æolian Accumulations.

SAND, sänd, George (1804–76). The name assumed by Armantine Lucile Aurore, Baroness Dudevant, a French novelist. She was born in Paris, July 5, 1804. Her father, Maurice Dupin, an officer, was the grandson of Marshal Saxe, the illegitimate son of Augustus II, King of Poland. She inherited a dashing temperament, democratic sympathies, and a taste for adventure; but all this was modified first by the training of her aristocratic grandmother, with whom she remained till 13 at the ancestral homestead in Berry, then by three years at a Parisian convent (called *le couvent des Anglaises*), where she developed a strain of mystic idealism. On her grandmother's death she returned to Berry (1820) and after two years was persuaded to marry Casimir Dudevant (1822), a country squire. With him she lived eight years. They had two children, to whom she was devoted. From 1829 she lived mainly in Paris on a slender allowance, eked out by decorative painting; in 1831 a partial separation was arranged, and this in 1836 was made final. Her first volume, *Indiana*, was written in 1832. With Jules Sandeau she wrote *Rose et Blanche*, signed "Jules Sand," whence she took her own pseudonym. Her work falls into four periods. The first, counting as typical *Valentine* (1832), *Lélia* (1833), *Jacques* (1834), *André* (1835), *Leone Leoni* (1835), closes with *Mauprat* (1837). Here the effort is to project her own marital experiences and so assert an intense individualism. But all reflect the grief and pride of a neglected wife. The novels after 1834 reflect also the first bitter disillusionment that came from her putting in practice the theory that passion should be the rule of life. She had formed a very close attachment with the poet Alfred de Musset; she journeyed with him to Italy (1833–34) and became estranged from him under circumstances much written of and lately rendered much clearer by new documents referring to Dr. Pagello, the third person in the tragedy. Her own version of the situation is to be found, with some novelistic embellishment, in *Préface à Lélia* (1833), *Lettres d'un voyageur* (1834), and much later, with a note of resentment, in *Elle et lui* (1859). Musset's brother Paul endeavored to represent his in *Lui et elle* (1859). The book of Charles Maurras (see *Bibliography*) has made use of a great deal of new material and summarized with great skill this famous passion, the echo of which has been so deep in literature (especially on Musset's side). One can say that to-day the discussion between "Mussetistes" and "Sandistes" can bring no new developments.

Returning to Paris, she made new friends, among them Chopin, Balzac, Liszt, the painter Delacroix, the philosophic priest Lamennais, and, after three years of arrested development during which she wrote *La dernière Aldini* (1838), *Les maîtres Mosaïstes* (1838), *Le compagnon du tour de France* (1840), and *Spiridion* (1840), she dazzled the world for eight years with brilliant pleas for the Socialistic revolution (1848). This is her second manner, typical of which are *Consuelo* (1843), its sequel, *La comtesse de Rudolstadt* (1844), *Le meunier d'Angibault* (1845), and *Le péché de M. Antoine* (1847). But the object lessons of the Revolution cooled her enthusiasm, and after Napoleon's accession she lived quietly at Berry. Here she developed a third manner, idyllic naturalism, forerunners of which had been *Jeanne* (1844) and *La mare au diable* (1846). Her more noteworthy novels of this type are *François le Champi* (1849), *La petite Fadette* (1849), and *Les maîtres sonneurs* (1853). The wider social studies of her fourth manner began in 1860, after some dramatic experiments, with the psychologic study *Jean de la Roche*, and this style counts as its best novels *Le marquis de Villemer* (1861) and *Mlle. la Quintinie* (1863).

Through her work there quivers a passionate rebellion against convention, moral or social. Her nature was simple, affectionate, and without vanity.

Bibliography. Her collected works appeared as *Romans et nouvelles*, 84 vols.; *Mémoires, souvenirs, impressions, voyages*, 8 vols.; *Théâtre*, 4 vols.; *Théâtre de Nohant*, 1 vol. (Paris, 1862–83); *Histoire de ma vie*, published first as a feuilleton in *La Presse* (ib., 1854), afterward in book form (ib., 1876); and *Correspondance* (6 vols., ib., 1882–84), especially the letters to Flaubert (q.v.). The chief documents with reference to Pagello, the Venetian doctor who stepped between Musset and G. Sand, are given in Cabanès: *Cabinet secret de l'histoire* (Paris, 1897); also C. Maurras, *Les amants de Venise* (Paris, 1904). The most convenient uniform edition of her writings is in 20 vols. (Philadelphia, 1901). Consult: F. W. H. Myers, in *Essays: Modern* (London, 1883); E. M. Caro, *A Life and Study of George Sand* (Eng. trans., by Masson, in "Great Writers Series" (ib., 1888); Paul Bourget, "George Sand et Alfred de Musset," in *Etudes et portraits*, vol. iii (Paris, 1906); Alphonse Séché, *George Sand* (ib., 1909); Lucien Buis, *Les théories sociales de George Sand* (ib., 1910); René Doumic, *George Sand: Some Aspects of her Life and Work* (Eng. trans. by Alys Hallard, New York, 1910). In 1904 the French celebrated the one hundredth anniversary of G. Sand, and a good deal of literature will be found in the French "revues" of that year. On the daughter of G. Sand, who was not without literary talents, see *La Revue* (Paris, Jan. 1, 1906).

SAND, zänt, Karl Ludwig (1795–1820). A German student, known as the assassin of the dramatist August Friedrich von Kotzebue (q.v.). He was born at Wunsiedel in Bavaria, studied theology at Tübingen and Erlangen, and in 1817 became affiliated with a Burschenschaft (q.v.) at Jena. He considered it his mission to kill Kotzebue, whom he regarded as a spy of the Russian court and one of the chief enemies of popular liberty. Entering the residence of Kotzebue in Mannheim, March 23, 1819, he murdered him with a dagger. He failed in an attempt on his own life and was decapitated May 20, 1820. The death of Kotzebue spurred on the champions of reaction to greater activity and led to the enactment of the Carlsbad Decrees (q.v.). Consult Hohnhorst, *Uebersicht der gegen Sand geführten Untersuchung* (Stuttgart, 1820).

SAN'DAL. See Shoes and Shoe Manufacture.

SANDAL'PHON. In the rabbinical system of angelology one of three angels who receive the prayers of Israelites. Longfellow used the legend in his poem "Sandalphon."

SAN'DALWOOD (from Fr. *sandal, santal*, ML. *santalum*, Gk. *σάνταλον, santalon*, from Hind. *sandal*, sandal tree). The compact, fine-grained, costly wood of several species of the genus *Santalum* of the family Santalaceæ, natives of the East Indies and tropical islands of the Pacific Ocean. It is used for making small ornamental articles and cabinets and is remarkable for its fragrance, due to an essential oil, which is so obnoxious to insects that they will not attack articles stored in sandalwood receptacles. White sandalwood, the most common kind, is derived from a small tree (*Santalum album*), a native of mountains in the south of India and the Indian Archipelago. It is much branched and resembles myrtle in its foliage and privet in its flowers. The tree is seldom more than 30 feet in height and 1 foot in diameter. A kind sometimes called yellow sandalwood is produced by *Santalum freycinetianum* of the Indian Archipelago and Hawaiian Islands, from which it is exported to China. *Santalum yasi* yields the much-valued sandalwood of the Fiji Islands. Sandalwood has been almost extirpated in Hawaii, Fiji Islands, and elsewhere in consequence of the demand for its wood in commerce. A less valuable sandalwood (*Exocarpus latifolius*) is exported from some of the South Sea Islands. Successful attempts have been made to cultivate *Santalum album* in India and elsewhere, and large plantations have been made of it. Sandalwood oil produced in Mauritius was valued in England in 1914 at $3 to $3.50 per pound. Red sandalwood, or sanders, is the product of *Pterocarpus santalinus*, of the family Leguminosæ, a native of tropical Asia, particularly of the mountains of the south of India and of Ceylon. The dark-red, black-veined heartwood, which sinks in water, is used as a dyestuff and to color certain druggists' preparations. It is also the basis of some tooth powders. The wood of *Adenanthera pavonia*, a relative of the acacias, is sometimes called red sandalwood or redwood.

Sandalwood oil is antiseptic and stimulating, especially on the genito-urinary tract, and is used medicinally in gonorrhœa and chronic bronchitis, being particularly valuable in the former disease. It is given in emulsion or capsules on account of its irritating effects on the stomach.

SANDALWOOD ISLAND, or Sumba. One of the Sunda Islands in the Malay Archipelago, belonging to the Netherlands and situated 40 miles south of the west end of Flores (Map: East India Islands, E 8). Area, about 4600 square miles. It consists of an elevated plateau 3000 feet above the sea, with steep and rocky coasts, and contains forests of valuable timber, including sandalwood and ebony. Cotton, spices, edible birds' nests, some timber, and an excellent breed of horses are exported, mainly from the chief centre, Waingapu. The island forms a part of the Residency of Timor and has a population estimated at 200,000, belonging to the Malay race.

SAN'DARAC (Fr. *sandaraque*, from Lat. *sandaraca*, from Gk. *σανδαράκη, sandarakē*, red sulphuret of arsenic, from Skt. *sindūra*, minium), or Sandarac Resin. A friable, dry, almost transparent yellowish-white resin, which is imported from the northwest of Africa. It is completely soluble in oil of turpentine, but not entirely in alcohol. When heated, or sprinkled on burning coals, it emits an agreeable balsamic smell. It exudes from the bark of the sandarac tree (*Callitris quadrivalvis*, natural order Coniferæ), a native of Algeria. The best qualities of sandarac are brought into commerce in the form of small transparent tears of a light-yellow color, specific gravity 1.5–1.9, with a faint aromatic odor and bitter taste. Sandarac contains three resins, separable by their difference of behavior towards alcohol and alcoholic potash. The quantity of sandarac used is not great; it is employed mostly for the preparation of varnishes under the name of gum juniper. Australian sandarac is commonly known as white-pine resin.

SAN'DAY, William (1843–1920). An English theologian, born at Holme Pierrepont, Nottingham, and educated at Balliol and Corpus Christi colleges, Oxford. From 1876 to 1883 he acted as principal of Hatfield's Hall, Durham, was then professor of exegesis and tutorial fellow of Exeter College, Oxford, until 1895, and thereafter Lady Margaret professor of divinity and canon of Christ Church. In 1903 he was appointed chaplain to the King. He published, besides commentaries: *Authorship and Historical Character of the Fourth Gospel* (1872); *The Gospels in the Second Century* (1876); *Inspiration* (1893), the Bampton lectures; *The Life of Christ in Recent Research* (1907); *Christologies, Ancient and Modern* (1910); *Personality in Christ and in Ourselves* (1911); *The Primitive Church and Reunion* (1913); *The Deeper Causes of the War* (1914); *Meaning of the War for Germany and Great Britain* (1915).

SAND BADGER. See Badger.

SAND BLAST. A device for cleaning, engraving, cutting, and boring glass, stone, metal, or other hard substances, by the percussive force of a rapid stream of sharp sand driven against them by artificial means. The process was invented by Gen. Benjamin C. B. Tilghman of Philadelphia. The means of propulsion may be either an air or a steam blast. In either case the abrading material, which is usually common hard sand, although small granules of iron or crushed quartz are occasionally used, is directed by a tube upon the object to be cut or engraved. The engraving of the surface of glass with ornamental figures is accomplished by laying upon it patterns of the desired objects cut out of some resistant medium in the manner of stencils. Another method very commonly used is to cut the proposed pattern in sheet copper or brass, which is then placed over the glass, a brush of melted beeswax being drawn over the whole. The stencil is then raised, and the pattern in exposed glass may then be operated upon by the blast. The sand blast is also useful in the cutting of ornaments and inscriptions upon stone. Iron stencils are sometimes used for the purpose, but the most satisfactory material is found to be sheet rubber of about one-sixteenth of an inch in thickness. This is cemented upon the stone, and a movable jet pipe is caused to traverse the surface of the latter until the exposed portions have been sufficiently abraded. The sand blast is often used for cleaning scale and rust from iron and steel structures to fit them for painting and for cleaning ornamental or structural stone.

SAND-BOX TREE. See Hura.

SAND BUR. See Burgrass.

SANDBY, săn'bĭ, Paul (1725–1809). An English water-color painter, engraver, and caricaturist. He was born in Nottingham, and in 1746, without previous training, he was appointed draftsman to the military survey of the Highlands and made numerous drawings of Scotland (now in the Print Room of the British Museum). He settled at Windsor in 1751 and subsequently made many drawings of Windsor, Eton, and other places in Britain, and also etched plates from his own designs. He was one of the original members of the Royal Academy and is known as the "father of the water-color art." His earliest works are tinted drawings, which he gradually improved by experiments until he attained his latest style of paintings in body color, which show great mastery and skill. He was also the first to practice aquatint in England. Among his best-known etchings are his witty caricatures of Hogarth. There are works by him in Windsor Castle, the Tate Gallery, and at South Kensington.

His brother Thomas (1721–98) was also one of the original members of the Royal Academy and its first professor of architecture. As landscape gardener and engineer he laid out part of Windsor Park and Virginia Water. Consult Sandby, *Thomas and Paul Sandby* (London, 1892).

SAND CRACK. See Quarter Crack.

SAND CRICKET. One of the long-horned grasshoppers of the family Locustidæ and genus *Stenopelmatus;* not a true cricket. See Grasshopper.

SAND CUSK. See Cusk, and Plate of Rockfish, Sunfish, etc.

SAND DAB. A reddish-brown turbot (*Hippoglossoides platessoides*) of the deep waters of the North Atlantic, closely related to the halibut. It is useful for food and is taken commonly on the coasts of Great Britain and Scandinavia and from Maine to Greenland. Two other species live in the North Pacific.

SAND DOLLAR. One of the smaller echinoids of the order Clypeastridea, which have the test very much flattened and approximately circular. Those species which have the test perforated by elongated holes, usually five or six in number, are often called keyhole urchins, and some of the larger species, without perforations, are called sea worms. The common sand dollar of the eastern United States is *Echinarachnus parma* and is locally abundant on sandy bottoms in comparatively shallow water, from New Jersey northward. It is 2 or 3 inches across and reddish brown in color.

SANDEAU, săn'dō', Léonard Sylvain Jules (1811–83). A French novelist and dramatist, born at Aubusson. He studied law in Paris, turned to journalism, wrote *Rose et Blanche* (1831) with George Sand (q.v.), was made keeper of the Mazarin Library in 1853 and Academician in 1858. He died in Paris. His better novels are *Mlle. de la Seiglière* (1848; dramatized, 1851) and *La maison de Penarvan* (1858). He collaborated with Augier (q.v.) in turning his inferior novel *Sacs et parchemins* (1851) into the great comedy *Le gendre de Monsieur Poirer* and wrote with him also *La pierre de touche.* His special domain is the conflict between a poor but proud aristocracy and the wealthy bourgeoisie, brought politically to the front in 1830. Consult G. E. B. Saintsbury, *Essays on French Novelists* (New York, 1891), and E. Breuillac, *Jules Sandeau* (Paris, 1909).

SANDEC, zän'dĕts. A town in Austria. See Neu-Sandec.

SAND EEL, or Sand Launce. One of a group of small fishes (Ammodytoidei) consisting of a single family, the Ammodytidæ, whose relationships are uncertain. All of the sand eels are small lanceolate creatures, with long, low, and fragile dorsal and anal fins and no ventral fins; the tail is small and forked. The skin has many transverse folds running obliquely backward and downward and is clothed with small cycloid scales. They are carnivorous fishes that swim in large schools near the shore in all northern regions and bury themselves in the sand near the tide mark. They are collected as bait, make an excellent pan fish, and furnish abundance of food for salmon and other valuable fishes. See Plate of Mullets and Allies.

SAN'DEMAN, Robert (1718–71). Leader and with John Glas (q.v.) founder of the sect of Glassites or Sandemanians. He was born at Perth, Scotland, studied for a short time at Edinburgh University, and engaged in the linen trade. Coming under the influence of Glas, he adopted his views, became an elder in his church (1744), and married his daughter. He became a Glassite preacher and in 1760 went to London, where he formed a congregation, whose members took the name of Sandemanians. Four years later he removed to America and established a church at Portsmouth, N. H. (1765), and other points in New England. He died at Danbury, Conn. His works include three *Letters on* [J. Hervey's] *Theron and Aspasio* (1757), which attracted much attention; *An Epistolary Correspondence between S. Pike and R. Sandeman* (1760); *Some Thoughts on Christianity* (1764); *Discourses* (with a biographical sketch, 1857). Consult references under Sandemanians.

SAN'DEMA'NIANS, or Glassites. A sect founded in Scotland by John Glas (q.v.) about 1730 and extended in England and America by his disciple and son-in-law Robert Sandeman (q.v.). The sect was called Glassites in Scotland, but Sandemanians became the more usual designation in England and America. The main doctrine of Glas was that all national establishments of religion and all interference of the civil authority in religious affairs are inconsistent with the true nature of the Church of Christ, which should be modeled on the churches of the New Testament. Both Glas and Sandeman held that saving faith consists in "a bare belief of the bare truth," which belief they regarded as the fruit of divine grace and the work of the Holy Spirit. It was considered necessary to separate from the communion and worship of all societies which appeared not to profess the "simple truth," and it was even held unlawful to join in prayer with any one not a brother or sister in Christ. The Lord's Supper was observed weekly, and "love feasts" or dinners were held every Sunday at the members' houses. There was a communistic tendency in that every one was required to consider all that he had at the service of the poor and the church and forbidden to lay up treasures on earth for any future or uncertain use. The discipline was primitive and severe; the kiss of charity was given at their meetings and foot washing of fellow disciples practiced. The sect, never very large, steadily declined in numbers after the beginning of the nineteenth century. It has been strongest in America at Danbury, Conn. Consult: Andrew Fuller, "Strictures on Sandemanianism," in his *Complete Works* (London, 1853); J. B. Marsden, *History of Christian Churches and Sects* (ib., 1856); J. E. Ritchie, *Religious Life of London* (ib., 1870).

SAND'ERLING. A common grayish snipe (*Calidris arenaria*, or *leucophæa*) remarkable for having only three toes. It is common on the coasts of North America and along the shores of large inland bodies of water, in small flocks in spring and fall. It is sometimes called surf snipe, and in spring, when the plumage acquires a reddish tinge with black markings, it is locally known as ruddy plover.

SANDERS, zän'dĕrs, Daniel (1819–97). A German lexicographer, born in Altstrelitz and educated at Berlin and Halle. From 1843 to 1852 he was rector of a school in his native town and then devoted himself to grammar and lexicography. From 1887 to his death he edited the *Zeitschrift für deutsche Sprache*. He took a special interest in modern Greek. His *Wörterbuch der deutschen Sprache* (1859–65) is a standard work. He also published *Wörterbuch der Hauptschwierigkeiten in der deutschen Sprache* (1872) and, besides some poetry, many works bearing on grammar, orthography, synonyms, etc. (1871–82).

SANDERS, săn'dĕrz, Frank Knight (1861–). An American college president, born at Batticotta, Ceylon. He graduated from Ripon College, Wis., in 1882 and in 1889 (Ph.D.) from Yale, where he was afterward Woolsey professor of biblical literature (1891–1901) and professor of biblical history and archæology and dean of the Divinity School (1901–05). For the next three years he held the secretaryship of the Congregational Sunday School and Publication Society and in 1908 became president of Washburn College. Besides editing with C. F. Kent *The Messages of the Bible* (12 vols., 1897–1912), Sanders is author of *The Messages of the Earlier Prophets* (1898); *The Messages of the Later Prophets* (1899; 6th ed., 1909); *The Teachers' Life of Christ* (1907); *Studies in the Life of Paul* (1908); *The Messages of the Sages* (1912); *History of the Hebrews* (1914); *How to Study the Old Testament* (1915), with H. A. Sherman.

SANDERS, Henry Arthur (1868–). An American classical scholar, born at Livermore, Me., and educated at the University of Michigan, at Berlin, and at Munich, where he received the degree of Ph.D. in 1897. He taught Latin at the University of Michigan (1893–95), the University of Minnesota (1897–99), and again at the University of Michigan, from 1899, becoming professor there in 1911. His publications include: *Roman Historical Sources and Institutions* (1904); *Roman History and Mythology* (1910); *The Old Testament Manuscripts in the Freer Collection: Part I, The Washington Manuscript of Deuteronomy and Joshua* (1910); *The New Testament Manuscripts in the Freer Collection: Part I, The Washington Manuscript of the Four Gospels* (1912). Facsimiles of both these important manuscripts have been published under the auspices of the University of Michigan (1910, 1912). For the history of the discovery of the manuscripts and the history of the manuscripts themselves, consult the Introduction to *The Old Testament Manuscripts, etc.* (see above); for their importance, consult B. W. Bacon, in *The Classical Weekly*, vi, 213–214 (New York, 1913).

SANDERS, săn'dĕrz, Nicholas (c.1530–81). An English Roman Catholic controversialist and historian, born in Charlwood, Surrey, and educated at Winchester College and at New College, Oxford, of which he became fellow in 1548 and professor of canon law. He was professor of theology at Louvain until 1572 and then went to Spain, where he urged the Catholic conquest of England. In 1579 he was sent to Ireland as Papal Nuncio to rouse rebellion against Elizabeth. Sanders's *De Visibili Monarchia Ecclesiæ* (1571) is a Catholic Foxe's *Martyrs*, and his *De Origine ac Progressu Schismatis Anglicani* (1585; Eng. version by Lewis, 1877), though it won for him the name of "Dr. Slanders" in England at the time, is not lacking in historical value.

SAN'DERSON, John (1783–1844). An American writer, born near Carlisle, Pa. He published with his brother, James H. Sanderson,

the first two volumes out of seven of the *Biography of the Signers of the Declaration of Independence* (completed by other hands; reëdited, 1865), and was also author of *Sketches of Paris* (1838).

SANDERSON, NICHOLAS. See SAUNDERSON, NICHOLAS.

SANDERSON, ROBERT (1587–1663). An English bishop. He was born in Sheffield and was educated at Lincoln College, Oxford. He was rector of Boothby Paynel from 1619 for over 40 years and prebendary of Lincoln in 1629. Upon the recommendation of Laud he became in 1631 chaplain to Charles I, who in 1642 appointed him regius professor of divinity at Oxford; he was deposed by Parliament in 1648. At the Restoration he was reinstated (1660) and the same year consecrated Bishop of Lincoln. In 1661 he was moderator at the Savoy conference between the Episcopal and Presbyterian divines. He published: *Logicæ Artis Compendium* (1618); *De Juramento* (1655); *De Obligatione Conscientiæ Prælectiones* (1660). His works were republished (Oxford, 1854), with a *Life* by Izaak Walton.

SANDERSVILLE, săn'dẽrz-vĭl. A city and the county seat of Washington Co., Ga., 59 miles east of Macon, on the Augusta Southern and the Sandersville railroads (Map: Georgia, D 3). It has a public library and sanitariums; oil mill, flour mill, sash, door and blind factory, monumental works, machine, carriage, and auto shops, ice plant, and fertilizer works. Farming, lumbering, and dairying are the chief industries. Pop., 1900, 2023; 1910, 2641.

SAND FLEA. See BEACH FLEA.

SANDFORD, săn'ford, FRANK W. (1862–). An American religious leader, born at Bowdoin, Me. He was educated at Bates College and at Cobb Divinity School, Lewiston, Me., and held pastorates in Free Baptist churches at Great Falls, N. H., and Topsham, Me. In 1893, announcing that he had received divine revelations commanding him to preach the gospel to all the world, he founded the Holy Ghost and Us Society, with headquarters at Durham, Me. The community comprised about 300 members, organized on a communistic basis. Under the leadership of Sandford the sect made several evangelistic world tours on vessels owned by the community. Despite an epidemic of smallpox in 1903, when several died, the society continued to believe in miraculous healings. It clung also to a belief in an approaching millennium.

SANDFORD AND MER'TON. A story by Thomas Day (1783–89).

SAND GROUSE. A game bird of the family Pteroclidæ, related more nearly to the pigeons than to the grouse. There are rather more than 16 species, chiefly African, but five are Asiatic and two of these occur also in Europe. They are in all important respects terrestrial pigeons, modified for a grouselike life. The genus *Syrrhaptes* contains the three-toed forms, of which there are two species. They have the feet feathered. The tail is long and pointed, the middle feathers filamentous and long-exserted. Both species occur in Asia, but occasionally migrate into Europe, even as far as England, in great numbers. The genus *Pterocles* contains the four-toed forms, of which the best known is the common or banded sand grouse (*Pterocles arenaria*), abundant in southeastern Europe. Another species (*Pterocles alchata*) also occurs in Europe and is sometimes called ganga, a name occasionally extended to the whole family. Consult: D. G. Elliot, "A Study of the Pteroclidæ," in *Proceedings of the Zoölogical Society of London* (London, 1878); B. R. Morris, *British Game Birds* (4th ed., 2 vols., ib., 1896); H. A. Bryden, *Nature and Sport in South Africa* (ib., 1897); E. C. Stewart Baker, "Indian Sand Grouse," in *Bombay Natural History Society, Journal* (Bombay, 1913–14). See Plate of PARTRIDGES, ETC.

SAND-HILL CRANE. A very large species of crane (*Grus mexicana*) found in the Mississippi valley and southeastward to Georgia and Florida. It is a shy bird, with acute sight and hearing. Its body is about 4 feet long. The name is extended to other cranes and is also erroneously given in some places to the great blue heron. See CRANE.

SAND HOPPER. An amphipod crustacean. These so abound on sandy shores that often the whole surface of the sand seems to be alive with the multitudes which, leaping up for a few inches into the air, fill it like a swarm of dancing flies. They may also be found by digging in the sand, in which they burrow. Sand hoppers leap by bending the body together and throwing it open with a sudden jerk. They feed on almost any vegetable or animal substance, particularly on what is already dead and beginning to decay. They are themselves the food of crabs and of many kinds of birds. See AMPHIPODA.

SAND'HURST. See BENDIGO.

SANDHURST ROYAL MILITARY COLLEGE. The preparatory college for military cadets of the British army, corresponding to the United States Military Academy (q.v.) at West Point. It is situated at Sandhurst, Berkshire, 33 miles west-southwest of London. Admission to the college is by open competition through examinations which are conducted each half year, under the direction of the Civil Service Commission. The age limits are 17 and 19½. The fees amount to $925 per year, including cost of uniform. Officers' sons are granted reduced rates. Sons of officers killed in action, called King's cadets, are appointed by the Secretary of State for War and pay no fees. See MILITARY EDUCATION.

SANDIA. See TANOAN STOCK.

SAN DIEGO, săn dē-ā'gō. A port of entry and the county seat of San Diego Co., Cal., 125 miles south by east of Los Angeles, on San Diego Bay and on the Atchison, Topeka, and Santa Fe, the Los Angeles and San Diego Beach, the San Diego and Arizona, and the San Diego and Southeastern railroads, and several steamship lines (Map: California, H 10). San Diego Bay forms a superb landlocked harbor, 22 square miles in area. The Navy and the War Department have separately large tracts of land on the bay, for a coaling station and fortifications respectively, the latter known as Fort Rosecrans. A health resort of some prominence, San Diego is favored by a beautiful situation and a mild equable climate. It is the seat of a State Normal School and has the Academy of Our Lady of Peace, the San Diego Army and Navy Academy, a high school costing $500,000, a stadium, a Carnegie public library, the Hospital of the Good Samaritan, and a handsome courthouse. The city's park lands comprise almost 2000 acres. Fort Stockton and the old Spanish mission are noteworthy features. Coronado Beach, across the bay, with the large Hotel del Coronado, Japanese garden, botanical gardens, and other attractions, is a popular resort. San Diego

has considerable commercial importance as the centre of extensive lemon and other fruit interests and as a port of entry. The value of the foreign trade in 1914 was $2,711,022, including exports to the amount of $908,143. The industrial establishments of the city in the year 1914 had an invested capital of $10,000,000, and an output valued at $9,000,000. The principal manufactured products are carriages and wagons, flour, furniture, fertilizers, show cases, vinegar, wine, citric acid, oil of lemon, of orange, etc. The commission form of government was adopted in 1909, but was replaced in 1915 by the city-manager plan. Pop., 1900, 17,700; 1910, 39,578; 1915, 51,115; 1920, 74,683. In 1769 the first California mission was established here, and in 1835 the pueblo was organized, San Diego thus being the oldest municipality in the State. In 1846 Commodore Stockton took possession of the place for the United States and established a fort which is still known as Fort Stockton. An exposition was held here during 1915 and 1916. Consult: Gunn, *San Diego: Climate, Productions, Resources, Topography* (San Diego, 1887); Wood, *Home-Land, Being a Brief Description of the City and County of San Diego* (ib., 1901); W. E. Smythe, *History of San Diego* (ib., 1907). See Dams and Reservoirs.

SAN DIEGO DE LOS BAÑOS, sän dē-ā'gō dā lōs bä'nyōs. A celebrated health resort in the Province of Pinar del Río, Cuba, among the mountains 22 miles northeast of Pinar del Río (Map: Cuba, B 4). There are sulphurous springs and baths. Pop., 1907, 1501.

SAND LAUNCE. See Sand Eel.

SAND MARTIN. See Bank Swallow, and Plate of Swallows.

SAN DOMINGO. See Santo Domingo.

SANDOR GJALSKI, shän'dōr jäl'skē, Xaver (1854–). Pseudonym of the Croatian novelist Ljubomir Babić. See Servian Literature.

SANDOVAL Y ROJAS, sän'dō-väl' ē rō'häs, Francisco de. See Lerma, Duke of.

SANDPAPER. An abrading material made by coating paper, or less often cloth, with glue and then covering it with sand. Other polishing materials made in a similar manner are emery paper and glass paper. Sandpaper is intermediate between glass paper and emery paper in its action on metals and less effective than glass paper on wood. A substitute for sandpaper is steel wool, whose chief advantage is its greater pliability, enabling a worker to polish or smooth down irregular parts of moldings or ornamental woodwork.

SAND PIKE. One of the local names of the sauger (q.v.), especially heard in the Great Lakes region, where this gray fish spends its time mainly over sandy bottom.

SAND'PIPER (so called from its notes and habit of running along the sand). Any one of a numerous group of shore birds, of the family Scolopacidæ, arranged in a large number of genera. They are not of large size, rarely over 1 foot in length; are active and graceful in all their movements; their plumage is not gay, but is of pleasing and finely diversified shades of buff, brown, gray, white, and black; their legs are rather long, the lower part of the tibia naked, the tail very short, the wings moderately long; the bill is rather long and slender, grooved throughout the whole or a considerable part of its length, straight in some and a little arched in others. The feet have three long toes before and one short toe behind; the front toes are sometimes partly webbed and sometimes cleft to the base; in the sanderling (q.v.) there are only three toes. They are good swimmers, but are not, however, often seen swimming; they frequent sandy shores, some of them congregating in numerous flocks in autumn and winter, and seek their food by probing the sand with their bills and by catching small crustaceans in pools or within the margin of the water itself. Many are birds of passage, visiting high northern latitudes in summer and spending the winter on the coasts of more southern regions. The flesh of all the species is good, and some of them are in much request for the table. The sandpipers all build very simple nests on the ground, sometimes in exposed places. The eggs are usually three or four, pyriform, drab, olive, or buff, heavily spotted with dark brown. They are placed in the nest with the small end at the centre. About 20 species occur in North America, of which the following are the most important: the stilt sandpiper (*Micropalama himantopus*) is about 9 inches long; in the plumage in which it is seen in the United States it is brownish gray, with white tail, upper tail coverts, and underparts. It breeds in the Arctic regions and passes through the United States during the migrations. The knot (q.v.) is a somewhat larger species, while the peep is decidedly smaller, and the stint (q.v.) is also very small. The pectoral sandpiper, or fatbird, or grass snipe, is a very widely distributed bird, 9 inches long, black and buff above, which breeds only in the extreme north. Closely allied to this species, but smaller and with white upper tail coverts, is the white-rumped sandpiper (*Tringa*, or *Pisobia, fuscicollis*). The red-backed sandpiper is the American representative of the dunlin (q.v.). The purple sandpiper (*Tringa*, or *Arquatella, maritima*) is a beautiful purplish species, eminently boreal and shy in its habits and rare except along the Atlantic coast, where it is commonly called rock snipe. Among the largest sandpipers are the yellowlegs (q.v.) and the solitary sandpiper. These represent the genera *Totanus* and *Helodromas* respectively. The Bartramian sandpiper, field or upland plover (*Bartramia longicauda*), occurs throughout eastern North America, but is a shy bird, frequenting open fields and pastures. The commonest and best-known species of this group in the eastern United States is the spotted sandpiper or tip-up (*Actitis macularia*). It is over 7 inches long, green gray above and white below, marked and spotted with black. It is not uncommon about bodies of fresh water and breeds throughout its range, which includes all of North America. Consult: Elliott Coues, *Birds of the Northwest* (Washington, 1874); D. G. Elliot, *North American Shore Birds* (New York, 1898); F. G. Aflalo, *Sport in Europe* (London, 1901); W. H. Hudson, *The Naturalist in La Plata* (4th ed., ib., 1903), also general works on ornithology and shooting. See Spoonbilled Sandpiper, and Colored Plates of Shore Birds; Eggs of Water and Game Birds; Plate of Beach Birds.

SAND PIPES. Cylindrical tubes descending perpendicularly into the ground, especially in chalk formations, and filled with sand, clay, or gravel. These tubes taper downward, ending in a point, and most probably have been produced by the solvent action of rain water as it drains downward through the soil.

SAND'POINT'. A city and the county seat of Bonner Co., Idaho, 69 miles northeast of

Spokane, Wash., on the Northern Pacific, the Great Northern, and the Spokane International railroads, and on Lake Pend d'Oreille (Map: Idaho, B 1). It is in a region noted for its picturesqueness and splendid fishing and has saw mills. Pop., 1910, 2993.

SANDRART, zän'drärt, JOACHIM VON (1606–88). A German painter, engraver, and art historian, born at Frankfort-on-the-Main. He studied at various times under Merian, Sadeler, and at Utrecht under Honthorst, whom he accompanied to England. In 1627 he went to Italy, where his portraits became so celebrated that he was commissioned to paint several for Pope Urban VIII. He returned to Germany in 1635, settled two years later at Amsterdam, and in 1641 on his estate near Ingolstadt. Afterward he established himself at Nuremberg, where his best-known work, "The Peace Banquet in 1649," containing 50 portraits, may be seen in the Rathaus. At Vienna he portrayed Emperor Ferdinand III and his wife, King Ferdinand IV, and Archduke Leopold. But of greater importance than his paintings are his writings, especially *Die deutsche Akademie der edlen Bau-, Bild-, und Malereikünste* (1675–79), revised by Volkmann (1768–75), critical edition by Sponsel (1896).

SAND RAT. A small burrowing rodent of the mole-rat family (Bathyergidæ), of which about 10 species occur in Africa of the genus *Georychus*. The name specifically applies to a species in Cape Colony (*Georychus capensis*). See MOLE RAT.

SANDRINGHAM, sän'drĭng-*am*. An estate of 7000 acres near Lynn in Norfolk, which was the favorite residence of King Edward VII when Prince of Wales. It was bought in 1862, and the present brick mansion, in the Elizabethan style, was built about 1870. In January, 1915, it was the objective of a German aërial attack. See WAR IN EUROPE.

SANDRO, AMICO DI ("Friend of Sandro") (active c.1470–85). The name given by Berenson to a Florentine painter of the Renaissance, whose work has generally been confused with that of Sandro Botticelli and Filippino Lippi (qq.v.). He seems to have been a follower of the former, and perhaps the teacher of the latter. His work is inferior to Botticelli's in modeling and composition, and while displaying considerable vivacity, lacks in depth of sentiment; but his warm golden color scheme is individual and pleasing. Among the paintings attributed to him are Madonnas in the public galleries of Naples, Budapest, London, and Berlin; an "Adoration of the Christ Child" (National Gallery, London); and portraits in South Kensington Museum, London, the Pitti Palace, Florence, the Gallery of Bergamo, the Liechtenstein Gallery, Vienna, and in the Louvre. Consult Berenson, *The Study and Criticism of Italian Art* (London, 1902).

SAN'DROCOT'TUS (Lat., from Gk. Σανδρόκοττος, *Sandrokottos*, from Skt. *Candragupta*, moon-protected (?–297 B.C.). A Hindu king, probably a native of the Punjab. For several years he was in the service of Mahapadma Nanda, King of Magadha (q.v.), but in some way he offended his patron and was exiled to Punjab. Here, after the murder of Porus (q.v.) by Eudemus, about 322 B.C., Sandrocottus gathered together a formidable force of warlike clans and made himself master of Punjab. He then invaded Magadha, which he conquered with ease, and established his capital at Pataliputra (q.v.) in 321 B.C. Here he founded the Maurya dynasty, which ruled until 178 B.C. About 305 B.C. Seleucus Nicator (see SELEUCIDÆ) invaded India to recover the territories which the Greeks had lost there. Details of this campaign are lost, but it is known that after a humiliating defeat Seleucus ceded to Sandrocottus Punjab, Sind, and eastern Afghanistan. The treaty was strengthened by the marriage of a daughter of Seleucus to the Indian King. This alliance had a result important for a knowledge of India of this period, for Seleucus sent as an Ambassador to the court of Sandrocottus the historian Megasthenes (q.v.), the fragments of whose *India* contain the earliest non-Hindu information concerning the country. As the grandfather of Aśoka (q.v.) Sandrocottus is frequently mentioned in Buddhistic literature. Sandrocottus is, furthermore, the hero of the single historical drama of India, the *Mudrārāksasa* of Viśakhadatta (q.v.). Consult: J. W. McCrindle, *Invasion of India* (2d ed., London, 1896); V. A. Smith, *Early History of Alexander the Great* (2d ed., Oxford, 1908); Auguste Bouché-Leclercq, *Histoire des Seleucides* (2 vols., Paris, 1913–14); E. J. Rapson, *Ancient India* (Cambridge, 1914).

SAND ROLLER. See TROUT PERCH.

SANDS, ROBERT CHARLES (1799–1832). An American poet and miscellaneous writer. He was born in Flatbush, Long Island, graduated at Columbia in 1815, and studied law. He contributed essays to various journals and wrote, with his friend J. W. Eastburn, an epic of King Philip's War, *Yamoyden* (1820). Though admitted to the bar, he devoted himself to literature, editing several short-lived magazines and, till his death, the *Commercial Advertiser*. He collaborated with Bryant and Verplanck in an Annual, *The Talisman* (1828–30), and *Tales of Glauber Spa* (1832), and wrote *Life and Correspondence of Paul Jones* (1831). His *Works* were collected by Gulian C. Verplanck, with a *Memoir* (2 vols., 1834).

SAND SHARK. One of the small voracious sharks of the family Carchariidæ, which have very sharp, triangular, and finely serrated teeth.

TEETH OF SAND SHARK.

These sharks are of moderate size, chiefly inhabit the Atlantic Ocean, and one species (*Carcharias littoralis*), gray in color and about 5 feet long, is common off the eastern coast of the United States.

SAND SMELT. The British name for the fishes of the widely distributed family Atherinidæ, allied to the barracudas and mullets, the American species of which are known in general as silversides (q.v.). Two species occur in Great Britain, swarming in the creeks and estuaries along the coast, and are netted in great numbers in spring, when spawning, and when they make an excellent pan fish. The most numerous one is *Atherina hepsetus*, about 6 inches long and marked by a broad silvery stripe along the side. The resemblance of certain related species on the Pacific coast of the United States,

especially *Atherinops californiensis*, has led to its being called smelt there.

SAND SNAKE. A small snake of the boa family and genus *Eryx*, of which several species inhabit the Sahara and deserts to the eastward. They have no apparent neck, a blunt tail, are variegated in dull tints, creep about, half buried in sand, or explore holes in rocks, hunt at night for insects and small animals, and are often carried about by snake jugglers, who mutilate the tail to give the snake the appearance of having two heads.

SAND STAR. See OPHIUROIDEA.

SAND'STONE'. A stratified rock composed usually and chiefly of grains of quartz, but other minerals, such as mica, feldspar, hornblende, and pyroxene, may be present. With an increase in the size of the grains sandstones pass into conglomerates on the one hand, and with a decrease in grain size and increase in clayey matter they pass into shales on the other; by an increase in the percentage of lime carbonate they may also grade into limestones. Sandstones containing little cementing material between the grains are soft and occupy a mean position between consolidated sandstone and loose sands; those with much cementing material are very hard. The cement, which may be either lime carbonate, iron oxide, or silica, influences the crushing strength of sandstones, the last-named material giving the greatest hardness. The color is usually traceable to the presence of iron or carbonaceous matter and is commonly brown, yellow, red, gray, or white. Sandstones are widely distributed geographically and also geologically. It may be said in general that those found in the older formations are harder than those occurring in the younger series. A number of different varieties of sandstone have been recognized, among which the following may be mentioned: *Quartzite.*—A sandstone which has become hardened and sometimes more highly silicified by metamorphism. *Arkose.*—A highly feldspathic sandstone. *Freestone.*—A name applied by quarrymen to many sandstones on account of the easy way in which they can be dressed or cut. *Brownstone.*—A name formerly applied to certain reddish-brown sandstones found in the East, but now applied to sandstones of other colors coming from the same locality as the original brownstones. *Flagstone.*—A hard, thinly bedded, shaly sandstone used for pavements. *Bluestone.*—A kind of flagstone quarried largely in southeastern New York. *Novaculite.*—An extremely fine-grained siliceous rock found in Arkansas. *Grit.*—A hard coarse-grained sandstone. The most important use of sandstone is as a building material, for which it is admirably adapted by reason of its durability and the ease with which it can be wrought. Certain varieties are specially favored for structural purposes; in the eastern United States the Triassic brownstones of the Connecticut valley, the Berea sandstone of Ohio, the Medina sandstone, and the Potsdam quartzite of New York have been most extensively quarried. Varieties that are nearly free from iron oxide and clay are much sought after for use in glass manufacture, pottery making, and silica brick. Certain beds of the Berea sandstone of Ohio are of value for grindstones, and the novaculite of Arkansas is highly prized for making oilstones.

The value of sandstone for building purposes and of bluestone produced in the United States in 1913 was $7,033,067.

Bibliography. Buckley, "Building and Ornamental Stones of Wisconsin," in *Wisconsin Geological Survey, Bulletin No. 4* (Madison, 1900); G. P. Merrill, *Stones for Building and Decoration* (3d ed., New York, 1903); H. T. Dickinson, "Bluestones and Other Sandstones in the Upper Devonian in New York State," in *New York State Museum, Bulletin No. 61* (Albany, 1903); Heinrich Ries, *Building Stones and Clay Products* (New York, 1912). For maps and statistics, see especially United States Geological Survey, *Mineral Resources of the United States* for 1911, 1912, and 1913 (Washington, 1912–14). See BUILDING STONE.

SAND SUCKER, or CALIFORNIA WHITING. A dusky gray fish (*Menticirrhus undulatus*) related to the Eastern kingfish and common along the sandy coasts of southern California, where it is a food fish of some importance. It receives its name from an erroneous popular belief that it feeds on sand.

SANDUS'KY. A city, port of entry, and the county seat of Erie Co., Ohio, 49 miles by rail south by east of Toledo, on Sandusky Bay and River and on the Lake Shore and Michigan Southern, the Baltimore and Ohio, the Pennsylvania, the Lake Erie and Western, and the Cleveland, Cincinnati, Chicago, and St. Louis railroads (Map: Ohio, E 3). It is finely situated and has a spacious harbor. Cedar Point, within the limits of Sandusky, is an attractive summer resort. The State Fish Hatchery, public library, Soldiers' Home, the courthouse, the new high school, two large hospitals, and the Federal building are noteworthy features. The city has a splendid park system. Excellent transportation facilities have enhanced its commercial importance. A large trade is carried on in coal, fruit, stone, lime, and lumber, and there are also extensive fish and ice interests. The industrial establishments in the census year 1909 had an invested capital of $6,494,683, and an output valued at $5,946,853. Tools, chemicals, paper, agricultural implements, lumber products, automobile and aëroplane engines, dynamos, glass, and cement are the principal manufactures. Shipbuilding is another important industry. Sandusky was settled in 1817 and was incorporated as a city in 1845. It adopted the commission form of government in 1916. On May 16, 1763, Fort Sandusky here was captured by the Indians, and the garrison except the commander, Ensign Paully, massacred. Near by in 1782 a force of 480 men under Colonels Williamson and Crawford was defeated by a larger Indian force. Pop., 1900, 19,664; 1910, 19,989; 1915 (U. S. est.), 20,160; 1920, 22,897.

SAND WASP. A wasp which makes its nest in a burrow in the soil, preferably where sandy, and provisions cells in which its eggs are placed. (See MUD WASP.) The most prominent species is the great yellow *sphecius*, which stores cicadas in its burrows and hence is called cicada killer.

SAND'WICH (village on the sands). A town of Kent, England, one of the Cinque Ports, on the Stour, 11 miles north of Dover (Map: England, H 5). It is rectangular. The houses, which seem crushed together and the architecture of which recalls the Plantagenet period, are strikingly antique in appearance. The church of St. Clement's, with a low Norman tower, is probably the most interesting edifice. The town owns a guildhall, three ancient hospitals, etc. The port admits small vessels of 12 feet draft.

The most ancient of the Cinque Ports (q.v.), it occupies the site of the Roman Rutupiæ. At the commencement of the eleventh century it was the most famous of all the English ports. It was incorporated by Edward III. Within the last 800 years the sea has gradually receded until Sandwich is now 2 miles from the shore. Pop., 1901, 3174; 1911, 3040. Consult Montagu Burrows, *Cinque Ports*, in "Historic Towns" (London, 1888).

SANDWICH. A town and the county seat of Essex County, Ontario, Canada, on the Detroit River, adjoining the city of Windsor and opposite Detroit, Mich., and on the Essex Terminal Railway (Map: Ontario, B 9). Assumption College (Roman Catholic) is located here, and also a Dominion fish hatchery. The manufactures include salt and chemicals. Pop., 1901, 1450; 1911, 2302.

SANDWICH. A city in De Kalb Co., Ill., 60 miles west of Chicago, on the Chicago, Burlington, and Quincy Railroad (Map: Illinois, G 2). It has manufactories of farm implements, pumps, and windmills. Pop., 1900, 2520; 1910, 2557.

SANDWICH, Edward Montagu, Earl of (1625–72). An English admiral, son of Sir Sidney Montagu, a Royalist, but himself in his early youth a Parliamentarian. He raised a regiment when 18, fought at Marston Moor in 1644 and in 1645 at Naseby. In 1656, thanks to his friendship with Cromwell, he was appointed Blake's colleague. Deprived of all commands save that of admiral, after the fall of Richard Cromwell, Montagu joined the party in favor of the Restoration. His intrigues at this time, and especially his friction with General Monk, are vividly sketched in the diary of his secretary, Samuel Pepys (q.v.). On the return of Charles II Montagu became Earl of Sandwich and was intrusted with negotiations for the King's marriage with Catharine of Braganza and for the cession of Tangiers to England. He won the victory of Lowestoft over the Dutch in 1665 and was promoted to be commander in chief, from which post he was soon retired because he had permitted the illegal distribution of prize money by his own officers. But his popularity was largely regained by his successful conclusion of the treaty with Spain in 1668. In 1672, as second in command to the Duke of York, he was defeated by Ruyter off Solebay; his flagship blew up, and he was killed.

SANDWICH, John Montagu, Earl of (1718–92). An English politician, notorious for his political and personal vices. He succeeded to the title at the age of 11, studied at Eton and at Trinity, Cambridge, and after two years on the Continent entered politics, becoming Lord of the Admiralty. In 1748 he became First Lord of the Admiralty and attempted to reform naval administration. Sandwich first earned the ill opinion of the people by turning on John Wilkes, an old friend and companion in his ribaldry, partly for political reasons. This unpopularity he augmented by his management from 1771 to 1782 of the Admiralty, of which he was again First Lord, purely for party purposes, and by his keeping for years as mistress Miss Martha Ray, who was shot in 1779 by the Rev. James Hackman, an unsuccessful lover, and whose murder revealed the story of her life. After the fall of North's cabinet in 1782 Sandwich did not return to public life. Awkward and uncouth as he was and the most hated man of his time, he was yet a man of singular personal charm. In anecdote the Earl figures as inventor of the sandwich.

SANDWICH ISLANDS. The former name of the Hawaiian Islands (q.v.).

SANDY HILL. Formerly a village and the county seat of Washington Co., N. Y., its name having been changed in 1910 to Hudson Falls (Map: New York, G 4), situated 57 miles by rail north of Albany, on the Hudson River, and on the Delaware and Hudson Railroad. It is an important lumbering and stone-quarrying centre and is engaged in the manufacture of foundry and machine-shop products, shirts, saw and planing mill products, and paper, and in the printing of wall paper. Pop., 1900, 4473; 1910, 5189.

SANDY HOOK. A low, narrow, sandy peninsula, or spit, running about 6 miles northward from the coast of New Jersey, partly inclosing Lower New York Bay (Map: New Jersey, E 3). Near its north end are Fort Hancock, the United States heavy-ordnance proving grounds, and a lighthouse 88 feet high, with a light visible for 15 nautical miles.

SANDYS, săn'dĭs *or* săndz, Edwin (c.1516–88). An English archbishop, born at Hawkshead, Lancashire. He graduated at St. John's College, Cambridge, in 1541, became prebendary of Peterborough in 1549 and of Carlisle in 1552, and was appointed vice chancellor of Cambridge in 1553. He was favorable to the Reformation and, having preached in favor of Lady Jane Grey, was imprisoned in the Tower, from which he escaped and fled to the Continent in 1554. He returned to England on the day of Elizabeth's coronation, was made Bishop of Worcester in 1559, of London in 1570, and Archbishop of York in 1576. He was a translator of the Bishop's Bible and a commissioner to revise the liturgy. His *Sermons, with Miscellaneous Pieces and Biographical Notice* by the Rev. John Ayre, were published at Cambridge in 1841.

SANDYS, Sir Edwin (1561–1629). An English statesman. The second son of Archbishop Sandys, he was born in Worcestershire and was educated at Corpus Christi College, Oxford, where he was a pupil of Richard Hooker, graduating in 1589. In 1599 he joined James VI in Scotland, by whom, as James I, he was knighted. He was a leading member of the House of Commons and was a member and treasurer of the second Virginia Company. It was largely due to his efforts that a charter was obtained for the Plymouth Colony. Consult Alexander Brown, *The First Republic in America* (Boston, 1898), and John Fiske, *Old Virginia and her Neighbours* (2 vols., ib., 1900).

SANDYS, Frederick (1832–1904). An English painter and draftsman, born in Norwich. He studied with his father and later was associated with the Pre-Raphaelite group. His caricature of Millais's "Sir Isumbras at the Ford" under the title "A Nightmare" (1857), attracted wide attention. Much of Sandys's best work was in the form of woodcuts, executed for the magazines, such as "The Old Chartist" and "Rosamund." His subjects were usually taken from Scandinavian mythology or mediæval legends; his draftsmanship is fine, and his conception lofty and individual. His few paintings in oil, exhibited during the sixties, are severely archaic in style and less convincing than his drawings. They include: "Vivien" (1863), "Medea" (1869), "The Valkyrie," and "Morgan le Fay" (1864). He also drew numerous chalk portraits of fa-

mous men of his day, including Tennyson, Matthew Arnold, and George Monckton.

SANDYS, GEORGE (1578–1644). An English traveler and poet. The seventh son of Archbishop Sandys, he was born at Bishopsthorpe, Yorkshire, and was educated at St. Mary Hall, Oxford. He succeeded his brother as Treasurer of Virginia in 1621, served in that office until 1625, was appointed to the Council in 1624 and reappointed in 1626 and 1628. But, the other members having charged him with defiance of the rights of other settlers, he left the Colony. He published translations of Ovid's *Metamorphoses* (1626), the first translation of a classic made in America; also poetical versions of the *Psalms* (1636), of *Job, Ecclesiastes,* and *Lamentations* (1639); and *Christ's Passion: A Tragedy* (1640), translated from the Latin of Hugo Grotius. Consult Richard Hooper, *The Poetical Works of George Sandys, with an Introduction and Notes* (London, 1872), and Alexander Brown, *The Genesis of the United States,* vol. ii (Boston, 1890).

SANDYS, SIR JOHN EDWIN (1844–1922). An English classical scholar. He was educated at Repton School and at St. John's College, Cambridge. Obtaining his M.A. in 1870, he was tutor of St. John's until 1900. Since 1867 he had been classical lecturer at the same college, and this post he held till 1907. Sandys was knighted in 1911. Besides editing admirably several Greek texts, he published: *An Easter Vacation in Greece* (1886); a translation and enlargement, with H. Nettleship, of Oskar Seyffert, *A Dictionary of Classical Antiquities, Mythology, Religion, Literature, and Art* (1891); *The Harvard Lectures on the Revival of Learning* (1905); the important *History of Classical Scholarship* (vol. i, 2d ed., 1906; vols. ii–iii, 1908); *Orationes et Epistulæ Cantabrigienses* (1910); *A Short History of Classical Scholarship* (1915). He was supervising editor also of *A Companion to Latin Studies* (1910; 2d ed., 1913).

SAN FELIPE, săn fâ-lē'pâ. The capital of the Province of Aconcagua, Chile, situated 40 miles east by north of Valparaiso and near the base of Aconcagua (Map: Chile, E 4). It manufactures cordage and has considerable trade with Argentina, being a station on the Trans-Andean Railroad. Pop., 1907, 10,426.

SAN FELIPE. The capital of the State of Yaracuy, Venezuela, 120 miles west of Carácas (Map: Venezuela, D 1). Cacao, coffee, sugar, fruits, tobacco, grain, and brandies are produced. The town was founded in 1552 and destroyed by an earthquake in 1812. Pop., 1909 (est.), 17,959.

SAN FELIPE. See KERESAN STOCK.

SAN FELIPE DE JÁTIVA, hä'tē-vå. See JÁTIVA.

SAN FELÍU DE GUIXOLS, săn fâ-lē'o͞o dâ gē-hōls'. A town of northeast Spain, in the Province of Gerona, on the Mediterranean coast, 50 miles northeast of Barcelona (Map: Spain, G 2). It manufactures corks, which are exported in large quantities. The salting of fish is also important. There is a harbor with considerable shipping. Pop., 1900, 11,253; 1910, 11,327.

SAN FERNANDO, fĕr-năn'dō (formerly ISLA DE LEÓN). A town of southwest Spain, in the Province of Cadiz, on the island of León, near the inner Bay of Cadiz, 7 miles southeast of the city of that name (Map: Spain, B 4). It is a handsome town, but is surrounded by salt marshes. The principal public building, the Casa Consistorial, is one of the finest of its kind in Spain. There is an important naval academy, and outside the city stands a large and well-equipped astronomical observatory. The industries are represented by salt works, flour mills, an iron foundry, and manufactures of cordage and sails. A mile to the north lies the port of La Carraca, with wharves, docks, and an arsenal. Pop., 1900, 29,802; 1910, 25,371.

SAN FERNANDO. The capital of the Province of Colchagua, Chile, 86 miles south of Santiago, with which it has railway connection (Map: Chile, E 4). Pop., 1907, 9150.

SAN FERNANDO. A town of Cebú, Philippine Islands, situated on the east coast, 15 miles southwest of Cebú. Pop., 1903, 15,451.

SAN FERNANDO. The capital of the Province of La Unfoń, in Luzon, Philippines. It is situated at the entrance to the Gulf of Lingayén on the highroad and projected railroad between Manila and Laoag (Map: Philippine Islands, C 2). It has a harbor protected by a small peninsula. Pop., 1903, 16,095.

SAN FERNANDO. A town of Luzon, Philippine Islands, in the Province of Pampanga (Map: Philippine Islands, C 3). It is situated about 4 miles northeast of Bacolor, has a telegraph station, and is a station on the Manila-Dagupan Railroad. It is an important centre of the sugar industry and has several sugar mills and large storehouses. Pop., 1903, 13,556.

SAN FILIPO D'ARGIRÒ. See AGIRA.

SAN'FORD. A city and the county seat of Seminole Co., Fla., 125 miles by rail south by east of Jacksonville, on the St. John's River, and on the Atlantic Coast Line (Map: Florida, E 3). It has truck-farming, fruit-growing, and fishing interests. Pop., 1900, 1450; 1910, 3570.

SANFORD. A town in York Co., Me., 36 miles southwest of Portland, on the Boston and Maine Railroad (Map: Maine, B 5). It is an industrial centre, its manufactures including shoes, plush, blankets, carriage robes, worsted cloth, yarn, and lumber products. The Nasson School for young ladies is situated here. Settled about 1740, Sanford was first incorporated in 1768. Pop., 1900, 6078; 1910, 9049; 1915 (U. S. est.), 10,615; 1920, 10,691. Consult W. M. Emery, *The History of Sanford, Maine, 1661–1900* (Fall River, 1901).

SANFORD, EDMUND CLARK (1859–). An American psychologist and college president, born at Oakland, Cal. He graduated from the University of California in 1883, and five years later received the degree of Ph.D. from Johns Hopkins, where he was also a fellow (1887–88) and instructor (1888). Meanwhile he had taught at Oahu College, Honolulu, Hawaiian Islands, in 1883–85. At Clark University he served as instructor in psychology in 1889–92, as assistant professor from 1892 to 1900, and then as professor of experimental and comparative psychology until 1909, when he accepted the presidency of Clark College. After 1895 Sanford was joint editor of the *American Journal of Psychology,* and in 1902 he was president of the American Psychological Association. Besides many articles on psychological subjects, he is author of *A Course in Experimental Psychology* (1898).

SANFORD, PAUL. See METHUEN, BARON.

SAN FRANCIS'CO. A city in California, the metropolis of the Pacific coast of the United

States, the largest city of the region west of the Missouri River, the principal seaport on the west coast of North America, occupying a mountainous peninsula bordering upon the Pacific Ocean on the west, the Golden Gate on the north, and the Bay of San Francisco on the east. It is centrally located with respect to the coast of California (Map: California, C 5). As an ocean terminus its importance has been increased by the completion of the Panama Canal. Partially destroyed in 1906 (see SAN FRANCISCO EARTHQUAKE), it has been entirely rebuilt. It was the seat, in 1915, of the Panama-Pacific International Exposition (q.v.).

Description. The city's land area is 46.6 square miles. It is characteristically hilly, and the hills, cut in two directions by regularly drawn streets, rise steeply from sea level to several hundred feet above the sea. Southwest of the main portion of the city the Twin Peaks, with Mount Sutro and Mount Davidson, rise to more than 900 feet above water level. Telegraph Hill, Nob Hill, and Russian Hill are the best known. Telegraph Hill, once a signal station and later a pleasure resort, is now a part of the Latin quarter. Nob Hill took its name from the early millionaires, or "nobs," who built their homes there. It was the site of the palaces of Mark Hopkins, Leland Stanford, James C. Flood, and others who made their fortunes in the "bonanza days" of the famous Comstock Lode and the first transcontinental railways. Russian Hill, even before this time, had been the site of aristocratic dwellings.

An important part of the site of San Francisco was reclaimed from the bay. The Ferry Building stands on made land, and the water line once touched Montgomery Street. At other points, beginning near the site of the Panama-Pacific Exposition, which was one of the last areas to be reclaimed, extensive fills have been made. South of Market Street there is an extensive area which is nearly level. It is broken by the hills of the Potrero, where workingmen's homes look down upon a picturesque industrial district. West of the Potrero lies the Mission District, one of the oldest and most typical of the larger residential districts. The greater part of the city's homes, however, are north and west of Market Street, where the Western Addition and the great Richmond and Sunset districts mark successive steps in the spread of population.

The streets are for the most part broad and well paved. South of Market Street, those which run parallel with it in its lower course are practically level. North of Market Street, however, almost no attempt was made, in the original laying out of the city, to avoid the steepest grades. As a consequence the extension of the city in a northerly direction was once regarded as improbable if not impossible. The early use of the cable car did a great deal to overcome this handicap.

Running transversely through the principal part of the city, and furnishing an avenue into which flow streams of traffic from all directions, Market Street easily holds its own as the principal thoroughfare. Its supremacy was disputed by Van Ness Avenue and by Fillmore Street for a brief period after the great fire, but is now firmly reëstablished. The leading banks, department stores, newspaper offices, and office buildings are almost exclusively on or near Market Street. The junction of Market, Kearny, and Geary streets is regarded as the business centre of the city. The retail shopping district is on Market Street itself and on adjacent portions of Kearny, Sutter, Post, Geary, and Stockton streets, and Grant Avenue. Van Ness Avenue, which, next to Market Street, is the city's most distinguished thoroughfare, is the centre of a lively automobile trade. Fillmore Street and Mission Street each have their shopping centres. The Civic Centre is located near the junction of Van Ness Avenue and Market Street.

Climate. San Francisco has an invigorating climate, characterized by regular ocean winds, fog at certain seasons, and comparatively little variation in temperature. In more than 43 years the temperature has never gone below 29° F. nor risen above 101° F. The mean temperature ranges from 50° F. for the month of January to 61° F. for September. "Killing frosts" are almost always confined to the months of December and January. Rainfall, even during the so-called rainy season, is not continuous. It is heaviest from December to March inclusive, with lighter rains in April and November and occasional showers in October and May. The rainfall averages about 21 inches. Semitropical plants flourish in the open air throughout the winter. There are many sunny days in every month in the year. Snow has fallen but 13 times in 37 years. Thunderstorms rarely occur. The prevailing west wind rises in the afternoon, attaining its greatest velocity at 4.30 o'clock. The fog which drifts in almost every afternoon during the summer months is regarded with great affection by seasoned residents.

Parks and Boulevards. Golden Gate Park, containing 1013 acres, was reclaimed from the sand dunes. Within its limits are nine baseball diamonds, a dozen tennis courts, a 30-acre stadium, a well-equipped children's playground, a zoölogical garden, and an infinite variety of flowers, plants, and trees. There are many miles of winding walks and drives. The Main Drive, which extends the full length of the so-called Panhandle, is 4½ miles long, emerging upon the ocean beach. The well-filled museum in the park is a tangible reminder of the California Midwinter International Exposition of 1894, of which it formed a part. It contains a large collection of valuable works of art.

In all, San Francisco had, in 1915, 32 public parks and squares, embracing 1398.6 acres, or 4.7 per cent of its total area. The military reservation of the Federal government, known as the Presidio (q.v.), is practically a part of the park system. It is probable, also, that at least a part of the Exposition site will become a public park.

Since the fire the city government has devoted much money and thought to the improvement of its roads and boulevards. An idea of their extent may be gained by making the trip out Van Ness Avenue, thence over the Exposition site to the Presidio, thence through the winding roads of the military reservation to Lincoln Park, whence may be had a superb view of the Golden Gate and the open sea, thence past the Cliff House to the Great Highway, which runs close to the ocean for about 3 miles, and back by way of Sloat Boulevard and Corbett Road. The historic Mission Road, the city's oldest thoroughfare, has recently been modernized and crosses Islais Creek, near the southern border of the city, on a reinforced-concrete viaduct erected in 1911 at a cost of $214,000.

Buildings and Institutions. An account of the municipal buildings may be found below in connection with a list of other public works completed since 1906. In the perspective of nearly a decade the chief effect of the great fire upon the physical appearance of San Francisco appears to have been to hasten the replacement of the older type of building, which was predominantly of wood, with the steel-frame concrete structures typical of modern American cities. Two public buildings which survived the fire are the Post Office, a substantial structure of granite, costing over $5,000,000, and the Ferry Building, owned by the State, an edifice distinguished by its graceful clock tower and one of the busiest passenger terminals in the United States.

The Pacific Building is one of the largest reinforced-concrete office buildings in the world. The Hobart Building, on Market Street, near Montgomery, is 21 stories high and was erected at a cost of about $1,000,000. The Humboldt Savings Bank Building is 18 stories high. The Claus Spreckels Building, which stood through the fire, is 19 stories high. Other towering buildings are the Mutual Savings Bank Building, the Chronicle Building, the Hearst Building, the Merchants Exchange Building, and the Insurance Exchange Building. Banks, stores, office buildings, and hotels in the business portion of the city are remarkable for the dignity and beauty of their architecture. Notable among many beautiful churches are Old St. Mary's, St. Luke's (Episcopal), the First Congregational, Temple Emanu-El, the First Presbyterian, and St. Mary's Cathedral. Mission Dolores, erected in 1782 and restored in recent years, is still used for religious services.

Among San Francisco's private libraries are the Mechanics' Mercantile, which contains a large collection of works on applied science as well as books on more general subjects; the Bibliothèque Française; the San Francisco Law Library, which will eventually revert to the city; and a Polish library.

Theatres, Clubs, and Hotels. The leading playhouses are the Orpheum, Alcazar, Columbia, Cort, Empress, Pantages, and Savoy. All are housed in attractive buildings constructed since the fire. Clubs are numerous. The Bohemian Club, originally composed of writers and artists, is famous for its annual "jinks," which are held in the Bohemian Grove in Sonoma County. Other well-known clubs are the Olympic Club, which is an athletic organization dating from 1860, the University Club, the Union League Club, the Press Club, the Family Club, the San Francisco Commercial Club, and the Sierra Club, the second largest mountaineering organization in the United States. The leading women's clubs are the Sorosis, Forum, California, Century, and the Council of Jewish Women. The best-known hotels are the St. Francis, the Palace, and the Fairmont, the latter occupying a superb site on the summit of Nob Hill. There are 487 hotels of more than 50 rooms and 619 of less than 50 rooms.

Suburbs. San Francisco is the centre of a suburban district whose population is rapidly approaching the million mark, and which is, in all ways save government, a unified metropolitan area. There are many commuters to the East Bay cities of Oakland, Alameda, and Berkeley, to Sausalito, Mill Valley, San Rafael, and other towns on the northern or Marin County shore, and to such peninsula towns as Burlingame, San Mateo, and Redwood City. About 50,000 commuters travel to and from their work, most of them residing in Alameda County. There are two highly developed electric-traction systems for this county.

Berkeley, which is reached by a 40-minute ferry and train ride from San Francisco, is the seat of the University of California. Stanford University is at Palo Alto, 30 miles south of San Francisco on the line of the Southern Pacific. Both these universities maintain well-equipped medical schools in San Francisco.

Commerce and Industry. The importance of the city is due to its position on San Francisco Bay (q.v.), which is accounted one of the finest harbors in the world. The San Joaquin and Sacramento rivers, which flow into the bay, afford water routes to the important interior cities of Stockton and Sacramento. There are steamship lines to the principal ports of the Orient as well as to the Atlantic coast. There is an active coastwise commerce. Foreign commerce has grown very rapidly. In 1901 the annual exports amounted to $41,638,410; by 1915 this figure had risen to $111,521,675. Imports in 1914 were nearly $70,000,000. Exports to foreign countries include cotton, canned goods, coal oil, fuel oil, barley, prunes, dried fruits, raisins, leather, lumber, and iron manufactures. In 1914, $28,130,357 worth of raw silk, $5,077,914 worth of coffee, and $2,742,492 worth of tea were among the imports. Other important imports are burlap, rice, tin ingots, nitrate of soda, olive oil, manila hemp, and copra. Customs receipts for the year ending December, 1914, were $5,022,789.05. The activity of trade is reflected in bank clearings, which in 1914 reached a total of $2,514,004,816. In 1914 San Francisco was eighth among American cities in the amount of its bank clearings and eleventh in the number of its manufacturing establishments. The Federal census of 1909 showed San Francisco to have 1795 manufacturing establishments, 28,329 wage earners, and $133,760,000 employed capital. The most important industries are sugar refining, slaughtering, meat packing, fruit canning, and the manufacture of foundry and machine-shop products. There are chocolate, perfume, and glass factories. The largest shipbuilding plant and dry dock in the West is located in San Francisco.

Government and Finance. San Francisco is governed by a charter which went into effect on Jan. 1, 1900, and has been liberally amended since. The city is governed by a mayor, elected for a four-year term, and a board of eighteen supervisors, elected at large. There is a strict civil-service system, administered by a board of three commissioners appointed by the mayor. The mayor may veto any item or portion of an item in the budget, and his veto can be overridden only by a five-sixths vote of the supervisors. He is endowed with an extensive appointing power and under certain limitations has the right to remove his own appointees.

The city budget of 1914–15 called for a total expenditure of $14,916,465.16, of which $434,910 was spent for the department of public works, $731,620 for the department of public health, $1,639,718 for the fire department, $1,980,200 for the school department, $375,000 for the park fund, $2,919,773 for bond interest and redemption. Until 1906 the city was practically free from debt. By 1914 the net bonded debt had in-

creased to $41,254,700, the increase being due to bonds issued for the work of rehabilitation and for various municipal enterprises. The tax roll of 1915 amounted to $538,092,750, and this assessed value represented an actual value of well over $1,000,000,000.

Public Works. San Francisco is estimated to have spent on rebuilding a sum equal to the cost of the Panama Canal. Of this amount no inconsiderable part has been spent by the city government on a notable series of municipal improvements. The most important of the new buildings are those which, when completed, will form the Civic centre. These buildings face on a public square bounded by McAllister, Larkin, Polk, and Grove streets and include a city hall, erected at a cost of $3,500,000, a municipal auditorium, to the cost of which the Panama-Pacific Exposition contributed $1,000,000, a public library, and a State building, each costing $1,000,000. The Hall of Justice is a dignified building, costing $1,100,000, overlooking historic Portsmouth Square, where the American flag was first raised in San Francisco. About $3,000,000 has been spent on hospitals. Besides the main public library there are six branch libraries. There are 94 public schools, many of them newly constructed. In 1915 there were 1390 teachers, and the total number of students enrolled was 61,941.

San Francisco has the distinction of putting into operation the first important municipal street-railway lines in the United States. Bonds amounting to $2,020,000 for the Geary Street road were authorized by popular vote on Dec. 30, 1909, and the road was opened for traffic on Dec. 28, 1912. On Aug. 26, 1913, additional bonds to the amount of $3,500,000 were voted for the purpose of extending the system. The lines are being added to partly by new construction and partly by absorption of the lines of the United Railroads of San Francisco, as the several franchises expire. On Oct. 1, 1915, the city operated 42.56 miles of single track. During 1914 the municipal lines carried 27,933,049 passengers and during the first eight months of 1915, 34,666,366 passengers. The net income for 1914, exclusive of taxes, from which the roads are exempt, was $216,541.25.

The Twin Peaks Tunnel, now being constructed by the city, will bring within a 25-minute radius of Market Street an additional territory which it is estimated will accommodate a population of 100,000 people. The tunnel will be a single bore, 25 feet wide and 12,000 feet long, will contain a double-track railway, and will be completed in 1917 at an estimated cost of about $4,000,000. The Stockton Street Tunnel, completed in 1914, opened a direct line for vehicular and street-car traffic between the down-town district and the North Beach section. Its length, including approaches, is 1324 feet, width 50 feet, height 18 feet, and cost $430,000.

San Francisco has guarded against the possibility of another great fire by the construction of an auxiliary high-pressure fire-protection system, which cost $5,750,000. It includes a reservoir on the Twin Peaks, 760 feet above the level of the harbor, with a capacity of 11,000,000 gallons, two pumping stations, and 72 miles of high-pressure mains. A pressure of 300 pounds is obtained.

The water front is under control of the State government. Here extensive improvements are being carried forward under a ten-million-dollar bond issue. On Jan. 1, 1915, there was a completed sea wall of 18,690 feet and 34 completed piers. The new docks and piers are principally of cement. The Belt Line, operated by the State for freight carrying on the water front, had, on Jan. 1, 1915, 20,600 feet of track.

Under an Act of Congress approved on Dec. 13, 1913, San Francisco secured rights to a watershed of 420,000 acres in the Yosemite National Park and Stanislaus National Forest. This is the famous Hetch Hetchy grant. In 1915 the city had already spent $2,000,000 in work preliminary to developing it. It is planned to secure a flow of 400,000,000 gallons a day over mains carried across the San Joaquin Valley. No date has been set for the completion of the undertaking, but when finished it will insure a plentiful supply of pure water for many years to come. Negotiations are also in progress for the purchase of the plant and reservoirs of the Spring Valley Water Company, which furnishes the greater part of the water now used.

Population. In 1910 San Francisco had a population of 416,912, 50.3 per cent of the population being native whites, 43.1 foreign-born whites, and 6.4 per cent belonging to colored races. There were 24,137 Germans, 23,151 Irish, 9815 English, 6244 French, 4641 Austrians, 10,582 Chinese, and 6988 Japanese. The number of Chinese is diminishing, while the Japanese are increasing slowly or not at all. The Chinese are segregated in a quarter of their own, which has been rebuilt since the fire with almost, if not all, of its former charm and color, while Japanese colonies may be found in several parts of the city. The population in 1915 was reliably estimated at about 525,000; 1920, 508,410.

History. The first settlement in this locality was made on Oct. 9, 1776, when two Franciscan monks, Palou and Cambon, established here an Indian mission, which they called San Francisco de Asisi, the name San Francisco having been previously given (in 1769) to the bay. About this mission, after the Mexicans secured control of California in 1822, a small village called Dolores grew up. The mission itself prospered until 1834, when it was secularized, and in a few years thereafter little remained but the adobe buildings. In 1836, near the best anchorage and 3 miles northeast of the mission, a small trading village, Yerba Buena, was founded, and from it the modern city really developed. In 1846 the United States took possession, and in the following year, its population then being 450, Yerba Buena exchanged its old name for that of the mission and the bay. On the discovery of gold in California in 1848 people of every social stratum and of many nationalities flocked hither, and the population of San Francisco increased with tremendous rapidity. In March, 1848, it was 800; in September, 1849, it was at least 10,000. In June, 1849, there were scarcely 50 houses; in September there were at least 500. The buildings were constructed of the most combustible materials and were huddled close together, so that the early years were marked by terrible ravages of fire. In the five big fires of Dec. 14, 1849, May 4, 1850, June 14, 1850, May 2, 1851, and June 2, 1851, the property destroyed reached an aggregate value of $16,000,000. Owing to the wild and turbulent character of much of the population and the lax enforcement of law by the constituted authorities, vigilance committees were organized in 1851 and 1856 and for a time tried, convicted, and pun-

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SAN FRANCISCO

UNION SQUARE (UPPER)
BUSINESS SECTION AND BAY (LOWER)

ished criminals in an extrajudicial manner. In 1854 overspeculation and a diminishing return from the mines caused a temporary check to the growth of the city, but in 1858 a new period of prosperity opened. San Francisco was incorporated in 1850, and in 1856 the city and the county were consolidated. An earthquake did some damage on Oct. 21, 1868. In 1877–78 San Francisco was the centre of the movement known as Kearneyism in California. (See KEARNEY, DENIS.) With the completion of the Union Pacific Railroad to the coast in 1869 the city entered upon a new period of prosperity. An era whose importance cannot yet be judged began in 1914 with the opening of the Panama Canal. See CALIFORNIA.

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SAN FRANCISCO BAY. An inlet of the Pacific Ocean indenting the coast of California and the most important harbor on the Pacific coast of the United States (Map: California, C 5). From its junction with San Pablo Bay it extends southeastward nearly 40 miles, being separated from the ocean by a peninsula 7 miles wide, at the north end of which is the city of San Francisco. It is from 5 to 12 miles wide. North of the city the Golden Gate, a passage from 2 miles to a little less than 1 mile wide and 4 miles long, connects the bay with the ocean. The water is generally shallow far out from the shores, but the Golden Gate and the part of the bay adjoining San Francisco as well as a central channel running through its whole length have a depth of 30 to over 100 feet. On the north the bay communicates with the Bay of San Pablo, which is of circular form with a diameter of 10 miles, and which further communicates through the Straits of Karquines with Suison Bay. The latter receives the Sacramento and San Joaquin rivers, so that the drainage of the entire western slope of the Sierra Nevada passes out through the Golden Gate. Consult George Davidson, *Discovery of San Francisco Bay* (San Francisco, 1907), and F. B. Sumner and others, *Report upon the Physical Conditions in San Francisco Bay* (Berkeley, 1914).

SAN FRANCISCO EARTHQUAKE. The most serious earthquake disaster that has occurred in the United States took place on April 18, 1906, and was centred in the coast section of California. The area affected was at least 450 miles in length, extending from Eureka in Humboldt County to the southern extremity of Fresno County and probably 50 miles wide at most points. The main shock was felt at about 5.13 in the morning; it caused the ground to sway sufficiently to wreck buildings, rupture the gas and water mains, and even to disturb heavy masonry in places. Minor shocks were recorded at intervals all through the day. The seat of the disturbance was a fracture or rift in an underlying stratum, which had previously given rise to earthquakes.

The damage resulting from the shock itself was relatively more serious in some of the outlying towns than in San Francisco, and the greatest loss was incidental to the impairment of the water service by which the control of the fires that broke out in the city became impossible. With the fire department practically helpless the city was soon the scene of one of the most extensive and hopeless conflagrations of modern times. For three days this conflagration raged in the heart of the business section. By the end of the first day an area along Market Street as far as 10th Street and from four to six blocks on each side had been destroyed by fire. With water from the bay and with the aid of the navy a narrow belt along the water front was saved; later on, salt water was used to fight the progress of the fire at greater distance. By April 21 the repairs upon the local water system began to give additional relief, and the fire was then brought under control. The failure of water forced a resort to destruction of buildings in order to remove the means of progress of the fire. Dynamite was used until the supply gave out, and then artillery was employed to finish the work. Although the fires repeatedly crossed the lines thus drawn for them, yet it was chiefly by such measures, together with the reaching of a few more open spaces and a shifting of the wind, that they were finally checked. The property loss was estimated at over $200,000,000. About a third of the city, including all of the business section, was laid in ruins. About 250,000 people were homeless, many of them wholly ruined financially. The water front was saved, as was also the district to the west of Van Ness Avenue, Octavia, and Dolores streets, including nearly all of the handsome private residences, except those of Nob Hill, capable of housing 250,000 to 300,000 people. Even in the burned district many buildings resisted the shock and fire so well that steps were soon taken to repair and reoccupy them. That no great privation or suffering ensued was due largely to the splendid organization of the relief measures taken by leading citizens as the Committee of Safety, and to the rigid control exercised by General Funston, who placed the city under martial rule. Prompt aid was voted by Congress and relief funds were liberally subscribed all over the country. The loss of life was remarkably small for the extent of the disaster; it was placed at 452 in all, of whom 266 were killed by collapse of buildings, 177 by fire, and 9 by incidental causes.

The cause of the earthquake, according to the report of the commission appointed by Governor Pardee of California to investigate its origin, was a displacement along a very extensive and well-marked fault line that extends for several hundred miles at a slight angle with the coast line. Movement is known to have taken place along this line for a distance of 185 miles, with a shift of the ground on opposite sides of the fault of from 6 to 20 feet. The country to the southwest of the line was permanently displaced northwesterly with reference to that on the opposite side. All effects of the shock diminished gradually with distance from this fault line. At a distance of 20 miles only an occasional chimney was thrown down, at 75 miles there were no destructive effects. The most notable exceptions to the strict rule of distance were San

José, 12 miles, and San Francisco, 8 miles, from the main fault. The greater destruction to San José is ascribed to the deep alluvial soil, and, in the low-lying portions of San Francisco, to the loose-made ground of the reclaimed bay. The results of the disaster showed that much greater destruction was caused to buildings standing on loose ground than to those on rock. Structures of good design, especially the steel-frame buildings, stood the shock very well. The general use of steel in the rebuilt section of the city is security against a recurrence of such a widespread disaster. Consult: D. S. Jordan (ed.), *California Earthquake of 1906* (San Francisco, 1907); California State Earthquake Investigation Commission, *Report*, published by the Carnegie Institution (Washington, 1908–10); H. F. Reid, *Mechanics of the Earthquake*, published by the Carnegie Institution (ib., 1910).

SAN FRANCISCO MOUNTAIN. The highest peak in Arizona, situated near Flagstaff in the north-central part of the State (Map: Arizona, D 2). It rises abruptly 5000 feet above the Colorado plateau to an altitude of 12,794 feet. Its core is of volcanic formation, and it is capped by a mass of lava in which there is an extinct crater. The body of the mountain, however, is formed by circumdenudation, the Triassic sandstone composing the sides being protected by the hard lava cap while the surrounding portions were worn away. The sandstone escarpment is now almost completely hidden by a talus of volcanic detritus. The mountain is a conspicuous landmark; the surrounding region has displayed fresh volcanic activity since the denudation of the plateau, and from the summit more than 100 craters may be seen.

SAN GABRIEL (săn gā′brĭ-ĕl *or* săn gä′brĭ-ĕl′) **INDIANS.** See GABRIELEÑO.

SANGALLO, săn-gäl′lō. A celebrated family of Italian architects of the Renaissance.—GIULIANO (1445–1516), the first to be distinguished and most important member of the family, was born in Florence, the oldest son of Francesco Giamberti, a woodworker. While very young he studied with Francione, a worker in tarsia (q.v.), but he acquired his architectural training among the ancient monuments of Rome. Returning to Florence to enter the army in the war with Naples in 1478, he gained great favor with Lorenzo de' Medici for his skill as a military engineer. For him he built the villa at Poggio a Cajano, where Lorenzo and his circle of humanists held their famous sessions, the beautiful church of Madonna delle Carceri at Prato, and the Augustine convent at Florence, near the San Gallo Gate, from which he derived the name later assumed by the family. He designed the Gondi Palace and the celebrated Strozzi Palace, for which Benedetto da Majano has received the credit, and built for Giuliano delle Rovere the fortress at Ostia. After the death of Lorenzo de' Medici he designed the ceiling of Santa Maria Maggiore and the cloister of San Pietro in Vincoli, and in 1503 he designed plans for St. Peter's, probably in competition with Bramante (q.v.), who won the appointment. Sangallo returned to Florence in 1509, taking part in the capture of Pisa. Upon the accession of Pope Leo X, formerly Cardinal Giovanni de' Medici, he was associate architect with Raphael at St. Peter's, serving in this capacity for about two years. He died at Florence, Oct. 20, 1516. In the Uffizi Gallery at Florence, the Barberini Library at Rome, and at Siena are many of his drawings, which are of extraordinary merit. His work as an architect, although he was one of the most important architects of the early Renaissance, was somewhat overshadowed by his prowess as a military engineer.

ANTONIO DA SANGALLO, THE ELDER (1455–1534), a younger brother of Giuliano, had a very similar career, excelling both as an architect and military engineer. He was employed by Pope Alexander VI in fortification work at the Castle of Sant' Angelo, at Civita Castellana, and at Nepi. He reconstructed the church at Arezzo and built the fine portico of the Annunziata, Florence, for Pope Leo X. His best work as an architect is the church of the Madonna di San Biagio at Monte Pulciano, where he also built the Cervini, Tarugi, and Bellarmini palaces. He took part in the defense of Florence in 1530, and died Dec. 27, 1534. Many of his drawings are preserved in the Uffizi Gallery.

ANTONIO CORDIANI DA SANGALLO, called THE YOUNGER (1485–1546), was a son of Giuliano. He went to Rome at 18 years of age, studied with Bramante, and did important work for 41 years under the popes Leo X, Clement VII, and Paul III. He was employed on the Castle of Sant' Angelo and the Farnese Palace at Rome and completed the Santa Maria di Loreto at Loreto. With his brother Battista he was engaged upon the Villa Madama in Rome, usually attributed to Raphael. In 1518 he was appointed to succeed Raphael as architect of St. Peter's and of the Vatican Palace. His model for the church is still in existence. (See SAINT PETER'S CHURCH.) His work as a military engineer was very extensive, comprising more than a dozen fortifications. He died at Terni, Oct. 3, 1546. Consult Giorgio Vasari, *Lives of the Most Eminent Painters, Sculptors, and Architects*, vol. iv (Eng. trans. by Blashfield and Hopkins, New York, 1896), and G. Clausse, *Les San Gallo, architectes, peintres, sculpteurs, médailleurs* (3 vols., Paris, 1900–02).

SAN GEMINIANO, FOLGORE DA. See FOLGORE DA SAN GEMINIANO.

SAN GENNARO, săn jĕn-nä′rō. See JANUARIUS, SAINT.

SANGERHAUSEN, zäng′ĕr-hou′zen. A town in the Province of Saxony, Prussia, 36 miles by rail west of Halle (Map: Germany, D 3). St. Ulrich is a splendid basilica, founded in the twelfth century and restored in 1892. There are two castles and two hospitals, dating from the thirteenth and fourteenth centuries. The manufactures include footwear, machinery, and other iron and steel products. Pop., 1900, 12,077; 1910, 12,753, chiefly Protestant. Sangerhausen is mentioned in 991.

SAN GERMAN, săn hĕr-măn′. A town of the Department of Mayaguez, Porto Rico, 10 miles south of the town of Mayaguez, near the coast, at the mouth of the river Guanajibo (Map: Porto Rico, A 3). Sugar, coffee, cacao, tobacco, and fruits are the principal exports. Pop., 1899, 3954; 1910, 4999.

SAN GIL, hēl, or **SAN JIL.** A town of the Department of Santander, Colombia, 150 miles northeast of the city of Bogotá, on the right bank of the Gil River. The manufactures are sulphate of quinine, straw hats, and cotton counterpanes; the agricultural products, cotton, sugar cane, and tobacco. Pop., 1912, 9965.

SAN GIMIGNANO, jē′mē-nyä′nō. A city in Italy, 7½ miles by carriage road west of Poggibonsi, which is 43 miles south of Florence. The

BLOODROOT, ETC.

1. CULVER'S ROOT (Leptandra Virginica).
2. BLOODROOT (Sanguinaria Canadensis).
3. RED CLOVER (Trifolium pratense).
4. DUTCHMAN'S BREECHES (Dicentra cucullaria).
5. BLACK COHOSH (Cimicifuga racemosa).

walls, the towers, and the Gothic architecture present a faithful picture of the age of Dante. The Palazzo Comunale, built 1288–1323, contains many ancient frescoes and paintings. The church of Sant' Agostino, built 1463–65, contains frescoes by Benozzo Gozzoli, the pupil of Fra Angelico. Pop. (commune), 1901, 9848; 1911, 10,365, (town) 4065.

SAN GIOVANNI A TEDUCCIO, sän jô-vän'nē à tā-dōō'chô. A suburb of Naples, Italy, situated in the direction of Portici. Pop. (commune), 1901, 20,797; 1911, 23,463.

SAN GIOVANNI IN PERSICETO, pĕr'sē-chā'tô. A town in the Province of Bologna, Italy, about 15 miles by rail northwest of Bologna. It has mineral springs, manufactures ironware, and markets grain. Pop. (commune), 1901, 15,893; 1911, 16,947.

SANGIR (sän-gēr') **ISLANDS.** A chain of 50 small islands in the Malay Archipelago, belonging to the Netherlands, extending from the northeast end of Celebes northward to Mindanao, Philippines, and separating the Celebes Sea from the Pacific Ocean (Map: East India Islands, F 5). The total area is 408 square miles, of which 308 square miles are taken up by Great Sangir. They are of volcanic origin. There are several active craters, notably Abu on Great Sangir, which has frequently caused great loss of life, notably in 1856, 1883, and 1892. The islands yield excellent timber and cabinet woods, and cocoa, sago, rice, tobacco, and sugar are also produced. The inhabitants are Alfuros, partly Mohammedans, partly pagans, with a few recently Christianized. Together with the neighboring Talauer Islands the Sangirs belong to the Dutch Residency of Menado, and the combined population of the two groups is estimated at 114,000.

SAN GIULIANO, sän jōōl-yä'nô, ANTONINO, MARQUIS DI (1852–1914). An Italian diplomat and statesman, born in Catania, of a noble and old family. His father was a Senator. He studied law, became mayor of Catania in 1879, and entered the House of Deputies in 1882. In Giolitti's ministry he was Undersecretary for Agriculture (1892–93), in Pelloux's Postmaster-General (1899–1900), and, after becoming a Senator in 1905, Minister of Foreign Affairs in the Fortis cabinet from December, 1905, to January, 1906. In the latter year he became Ambassador at London and later at Paris. From March, 1910, to his death, on Oct. 16, 1914, he was Minister of Foreign Affairs, serving in the cabinets of Luzzatti, Giolitti, and Salandra through the war with Turkey and the Balkan wars and well into the beginning of the Great European War. San Giuliano was strongly identified with the Triple Alliance, so that his death removed one of the hindrances to Italy's breaking with Germany and Austria-Hungary.

SANGRE DE CRISTO, sän'grā dā krēs'tō. A local name for a range of the Rocky Mountains in south-central Colorado, bounding the San Luis Park on the northeast (Map: Colorado, D 3). It rises steeply from the floor of the park to a height of 5500 feet above it. Its crest maintains an altitude of 13,000 feet above the sea for 15 miles and 12,000 feet for over 30 miles. Its highest point, Blanca Peak, has an altitude of 14,390 feet and is one of the two highest peaks of Colorado, while another peak, Old Baldy, is 14,176 feet high.

SANG'STER, CHARLES (1822–93). A Canadian poet, born at Kingston, Ontario. For 15 years he conducted newspapers at Amherstburg and Kingston, and from 1868 to his retirement in 1886 he was connected with the Post Office Department at Ottawa. He was one of the earliest among the native English-Canadian poets. The patriotic note which rang through his work had a wide appeal in his own country, and he is justly credited with a share in the making of Canadian national sentiment during a critical period. In 1860, when his second volume appeared, political difficulties in the British-American provinces threatened to end in deadlock or isolated provincialism; and his poems were a distinct contribution to the movement which seven years later resulted in confederation. He published *The St. Lawrence and the Saguenay, and Other Poems* (1856) and *Hesperus and Other Poems and Lyrics* (1860). Consult T. G. Marquis, "English-Canadian Literature," in *Canada and its Provinces* (Toronto, 1914).

SANGSTER, MARGARET ELIZABETH (MUNSON) (1838–1912). An American author and editor, born at New Rochelle, N. Y. She contributed to many periodicals and was editorially connected with several papers and magazines. Her numerous books, all of an "improving" tendency, include: *Hours with Girls* (1881); *Little Knights and Ladies* (1895), verses; *Life on Higher Levels* (1897); *The Little Kingdom of Home* (1904); *Good Manners* (1905); *Radiant Motherhood* (1905); *A Little Book of Homespun Verse* (1911); *My Garden of Hearts* (1913), a selection from her short stories and essays. Consult her *Autobiography* (New York, 1909).

SAN'GUINA'RIA (Lat. *sanguinaria,* fem. sing. of *sanguinarius,* relating to blood, from *sanguis,* blood, so called because supposed to stanch blood, but in modern usage because of the bloodlike juice). A genus of plants of the family Papaveraceæ. *Sanguinaria canadensis,* the only species, the bloodroot or puccoon of eastern North America, has a fleshy rootstock with a red acrid juice, found also in the stalks. The large white flowers, which appear in early spring, are solitary and arise from the root, on short stalks usually surrounded by the solitary, roundish, palmately lobed radical leaves.

SAN'GUINE (OF., Fr. *sanguin,* bloody), or MURREY. One of the tinctures in heraldry (q.v.), represented in engraving by diagonal lines crossing each other.

SAN'HEDRIN (Heb. *sanhedrin,* from Gk. *συνέδριον, synedrion,* council, from *σύν, syn,* together + *ἕδρα, hedra,* seat). The name in ancient times of the highest court of justice and supreme council in Jerusalem, in a wider sense applied also to lower courts of justice. Josephus designates the council established by Gabinius, the Roman governor of Syria (57–54 B.C.), in each of the five districts of Palestine as synedrion, but this intentional degradation of the Synedrion at Jerusalem points to the introduction of the term at an earlier period, and in fact it occurs in the Greek translation of the Old Testament. According to the Talmud the name goes back to the second century, for the chief council in the days of John Hyrcanus is called a Sadducean Sanhedrin (*Sanhedrin,* 52 b). The Sanhedrin is identical with the *Gerousia,* which occurs as a designation of the chief Jewish council in the days of Antiochus the Great (c.200 B.C.) and somewhat later. The degrada-

the water used in irrigating the surrounding district, is derived from an immense artificial reservoir. The town is noted for the manufacture of ponchos and exports horses, hides, and vicuña wool. Pop., 1912 (est.), 11,000.

SAN LUIS. A town of Luzon, Philippine Islands, in the Province of Pampanga, on the Rio Grande de Pampanga, about 10 miles northeast of Bacolor. Pop., 1903, 10,067.

SAN LUISEÑO. See LUISEÑO.

SAN LUIS OBISPO, săn lōō'ĭs ō-bĭs'pō. A city and the county seat of San Luis Obispo Co., Cal., 225 miles northwest of Los Angeles, on the Southern Pacific and the Pacific Coast railroads (Map: California, E 7). It contains the California Polytechnic School, the Mission of San Luis Obispo (founded by Father Junipero Serra in 1772), a Carnegie library, an Elks home, a Masonic Temple, and excellent public schools. There are in the city division headquarters and shops of both railroads. Pop., 1900, 3021; 1910, 5157.

SAN LUIS POTOSÍ, săn lōō-ēs' pō'tō-sē'. An inland state of Mexico (Map: Mexico, J 6). Area, 25,316 square miles. The greater part lies within the great Mexican plateau, but near the southeast corner the plateau falls steeply several thousand feet to the low valley of the Pánuco River. The climate is healthful in the elevated parts and hot and unhealthful in the lowlands, where fever prevails. The surface is abundantly wooded, and the soil is very fertile in the valleys, but agriculture is undeveloped. Tropical fruits are grown. Stock raising also is carried on. Mining has been revived and is now a leading industry. The chief products are gold, silver, copper, lead, zinc, iron, quicksilver, and petroleum. Commerce and manufactures are increasing, and the state is one of the richest and most progressive in the Republic. The capital is San Luis Potosí (q.v.). Pop., 1910, 627,800, including a large proportion of Indians.

SAN LUIS POTOSÍ. The capital of the State of San Luis Potosí, Mexico, situated on the plateau at the head of the valley of the Verde, 215 miles northwest of Mexico City and 6200 feet above sea level (Map: Mexico, J 7). It is almost hidden by luxuriant gardens and is regularly laid out, with broad streets and numerous plazas, on one of which is a marble fountain surmounted by a statue of Hidalgo. On the principal square stands the handsome cathedral and the fine city hall. Other notable buildings are the courthouse, the Governor's palace, the mint, and the Alarcón Theatre. The city is an important railroad centre. It has had a rapid commercial and industrial development. Its principal manufactures are woolen goods, furniture, matches, flour, soap, iron and brass, shawls, and cigars. It exports pottery, mineral products and hides and is the seat of the United States Consul. It is the fourth city in size in the Republic, with a population of 82,946 in 1910. It derives its original importance from the famous silver mines in the neighboring Cerro de San Pedro, discovered in 1583. Here in 1910 Madero issued his plan, which started the successful revolt against the Díaz régime. The city was captured by the Constitutionalists in 1914.

SAN MARCO IN LAMIS, săn mär'kō ĭn lä'mēs. A town in the Province of Foggia, Italy, on the southwest slope of Monte Gargano, 18 miles north by east of Foggia (Map: Italy, E 4). Cereals and fruits are produced, and wine and olive oil are manufactured. Pop. (commune), 1901, 17,309; 1911, 18,105.

SAN MARCOS, săn mär'kŏs. A city and the county seat of Hays Co., Tex., 50 miles northeast of San Antonio, on the International and Great Northern and the Missouri, Kansas, and Texas railroads (Map: Texas, D 5). It contains a State normal school, Baptist Academy, Coronal Institute, and a United States fish hatchery. Cotton, onions, and cattle are raised extensively, and there are a cotton gin and oil mill. Pop., 1900, 2292; 1910, 4071.

SAN MARINO, mä-rē'nō. A republic in the peninsula of Italy, between the provinces of Forlì and Pesaro-Urbino, near the Adriatic coast, 12 miles southwest of Rimini (Map: Italy, D 3). Area, about 38 square miles; pop., 1910, 10,489. It is the oldest state in Europe and one of the smallest in the world. The district is hilly, the highest point being Monte Titano (about 2650 feet). The climate is healthful. Cattle raising and wine production are the chief occupations. Stone figures among the exports. The uninteresting town of San Marino is situated on Monte Titano and is protected by a wall. It has five churches and a fine Parliament house. The governing laws—the Statuta Illustrissimæ Reipublicæ—date from the Middle Ages. In 1847 the ruling Grand Council was transformed into a representative chamber, with 60 life members, chosen from the burghers, landowners, and the nobility. Two members from this chamber are selected every six months as "reigning captains." From this council an executive council of 12 is chosen yearly. San Marino has a treaty of friendship with Italy. There is no public debt. The annual revenue and expenditure of the Republic amounted in 1914 to $193,541 and $125,232 respectively.

History. The city of San Marino, said to have been founded in the fourth century by St. Marinus of Dalmatia, formed part of the Byzantine Exarchate of Ravenna and, after an uneventful existence under Lombard and Frankish rule, gradually established its independence with the aid of the counts of Montefeltro. In 1631 it received a formal acknowledgment of its independence from Pope Urban VIII. Napoleon did not deign to tamper with the liliputian Republic, and sentiment probably led to the preservation of its identity in 1860–61, on the formation of the Italian Kingdom, under whose protection the Republic placed itself in 1862; since 1860 it has been in a technical state of war with Austria, and in 1914 it joined the allies against the Central Powers in the European War. Consult: P. Franciosi, *Garibaldi e la repubblica di San Marino* (Bologna, 1891); H. Hauttecœur, *La république de San Marino* (Brussels, 1894). See WAR IN EUROPE.

SAN MARTÍN, săn mär-tēn', JOSÉ DE (1778–1850). A South American general, distinguished for his services in the war of independence against Spain. He was born at Yapeyú in Argentina, Feb. 25, 1778, and as a child was sent to Spain, where he received his education. He entered the army and served with distinction against the French. In 1811 he laid down his rank of lieutenant colonel and in the following year went to Buenos Aires, where he threw in his fortunes with the patriot cause. In January, 1813, he defeated the Spanish Viceroy at San Lorenzo and in the following

year was placed in command of the insurgent army in Upper Peru. San Martín now conceived the design of destroying the Spanish power by overrunning Chile and then striking at the stronghold, Peru. After two years' preparation he set out in January, 1817, from Mendoza, with a well-drilled army of 4000 men, crossed the Andes with much hardship and on February 12 routed the Spaniards at Chacabuco. This led to the occupation of the capital and the establishment of the Republic, of which San Martín declined the proffered headship. Defeated at Cancha Rayada, March 19, 1818, he retrieved his fortunes by a decisive victory at the Maipo, April 5, definitely ending the Spanish power in Chile. In August, 1820, he set sail from Valparaiso, with an army of 4500 men, and landing at Pisco, some 150 miles south of Lima, entered the capital in July, 1821, and proclaimed the independence of Peru. In August he was chosen Protector. To Bolívar (q.v.), who in 1822 came to the aid of the Peruvians, San Martín left the task of completing the conquest of the country, resigning his command in August, 1822, and departing for Europe. He lived subsequently at Brussels and in France and died at Boulogne, Aug. 17, 1850. His life was one of devoted patriotism, marred neither by vainglory, factional hatred, nor personal interest. Consult Bartolomé Mitre, *Historia de San Martín y de la emancipación sudamericana* (Buenos Aires, 1890; abridged Eng. trans. by William Pilling, *The Emancipation of South America*, London, 1893).

SAN MATEO, săn mȧ-tā′ō. A city in San Mateo Co., Cal., 18 miles south of San Francisco, on San Francisco Bay and on the Southern Pacific Railroad (Map: California, C 5). It has a public library, three country clubs, fine city hall and school buildings, and many beautiful homes. There are nurseries, a salt factory, oyster beds, and agricultural and horticultural interests. San Mateo has commission government. Pop., 1900, 1832; 1910, 4384.

SANMICHELI, săn′mē-kā′lē, MICHELE (1484–1559). An Italian architect, born in Verona. He went to Rome, worked under Bramante, and made the acquaintance of Michelangelo, of Sansovino, and of Antonio Sangallo, with whom he was employed in repairing the fortifications of Central Italy. Sanmicheli is reckoned the first to use the bastionary system of fortification. He built imposing city gates in Venice and Verona, the Bevilacqua, Camossa, and Pompeii palaces in Verona (the last named being his masterpiece), the church of the Madonna di Campagna in the same city, and in Venice the Palazzo Grimani and the Palazzo Mocenigo, both famous for their façades.

SAN MIGUEL, mē-gȧl′. A city of the Republic of Salvador, situated 70 miles east of San Salvador at the foot of the volcano of San Miguel or Jucuapa (Map: Central America, D 4). It is the third city of the Republic in size, the capital of a department of the same name, and the centre of a rich agricultural region. It has some foreign trade, especially in indigo. Pop. (est.), 24,768.

SAN MIGUEL DE ALLENDE, dȧ ȧl′-yān′dȧ, or **ALLENDE.** A town in the State of Guanajuato, Mexico, 30 miles east of the city of that name (Map: Mexico, H 7). It is the birthplace of Allende, the Mexican patriot, and carries on a trade in horse equipments, blankets, etc. Pop., about 11,000.

SAN MIGUEL DE MAYUMO, dȧ mȧ-yo͞o′mō. A town of Luzon, Philippine Islands, in the Province of Bulacán, situated 22 miles northeast of Malolos. Pop., 1903, 14,919.

SAN MIGUEL DE TUCUMÁN. See TUCUMÁN.

SAN MINIATO, mē′nē-ä′tō. 1. A city in the Province of Florence, Italy, 21 miles by rail west-southwest of Florence. The tenth-century cathedral was remodeled in 1488. The city has a castle built by Barbarossa, a lyceum, and a seminary. There are manufactures of glass, leather, and straw goods and olive oil. Pop. (commune), 1901, 20,042; 1911, 22,253. 2. An ancient church near Florence (q.v.).

SANNAZARO, săn′nȧd-zä′rō, JACOPO (1456–1530). An Italian author, born at Naples. Trained there, he was introduced into the Arcadian Academy, in which he was known as Actius Syncerus. Frederick III, to whom he was devoted, gave him the villa at Mergellina, and when Louis XII's expedition of 1501 obliged Frederick to leave his realm, Sannazaro joined him in exile and served him until his death in 1504. Sannazaro's masterpiece is the *Arcadia*, a pastoral composition in mingled prose and verse, which shows Boccaccio's influence in language and style and helped to form the prose of the period. The work was imitated and translated into foreign languages and influenced the development of the pastoral in European countries. Sannazaro's minor works in Italian comprise some short monologues and a few allegorical farces and his various *Rime*, largely Petrarchian in inspiration. His Latin compositions are among the best of the time. They include elegies, eclogues, and epigrams, besides a longer poem, *De Partu Virginis*. Consult the *Life* in the edition of the *Opere Volgari* (Padua, 1723); the *Opere Latine* (Amsterdam, 1728); Colangelo, *Vita di Jacopo Sannazaro* (Naples, 1819); an edition of the *Arcadia*, and a discussion of its composition by M. Scherillo, in *Arcadia di Jacopo Sannazaro secondo i manoscritti e le prime stampe con note, etc.* (Turin, 1888); E. Carrara, "La poesia pastorale," in *Storia dei generi letterari italiani* (Milan, 1908).

SAN NICOLAS, săn nē′kō-läs′. A town of Luzon, Philippine Islands, in the Province of Pangasinán, situated about 33 miles east of Lingayén. Pop., 1903, 9780.

SAN NICOLÁS, or SAN NICOLÁS DE LOS ARROYOS. A town in the Province of Buenos Aires, Argentina, on the Paraná River, 40 miles below Rosario (Map: Argentina, G 4). It has a national college and a normal school. It is a growing industrial centre and has steam flour mills and large beef-preserving establishments. It is an important railroad centre and river port. Pop., 1912 (est.), 20,000.

SAN'NIKOFF LAND. The most northwesterly of the islands of the New Siberian Archipelago, in about lat. 76° N., long. 159° E., first seen by Jacob Sannikoff (1805), and again by Baron Toll (1886) from the north point of Kotelnoi Island. Consult Toll, *Die russische Polarfahrt der Sarja* (Berlin, 1909).

SANNYASIN, sȧn-nyä′sĭn (Skt., renouncer). The Sanskrit term for one who has renounced all earthly interests and has devoted himself to a life of asceticism. It referred originally to a Brahman in the fourth and last stage of his life. (See BRAHMANISM.) The meaning of the word has been extended, however, to include

purpose being made in the Federal and State systems, the latter also delegating to municipal corporations the powers necessary to make and enforce regulations for the protection of the public health within their jurisdictions. (See HEALTH, BOARDS OF.) The diseases which require the attention of the legislator may be classified as endemic, contagious, and epidemic. (See CONTAGIOUS DISEASES; ENDEMIC; EPIDEMIC.) Boards of health are not liable for errors of judgment when acting within their jurisdiction, though they are liable for negligence. Yet a city or municipality cannot be held responsible for the negligence of a physician of the board, the mismanagement of its hospital, or even the wrongful appropriation of property by members of the board of health, for the purpose for which the board is created is governmental in character and the municipality derives no benefit in its corporate capacity from the performance of this duty.

Consult W. G. E. Lumley, *Public Health* (6th ed., 2 vols., London, 1902), and *Stockman's Inspector's Guide* (2d ed., ib., 1904). See NUISANCE; POLICE POWER; QUARANTINE, ETC.; and consult references there given.

SANITARY SCIENCE. The subdivision of hygiene which treats of ascertained facts and verified theories concerning preservation of health, prevention of disease, and prolongation of life. The subject naturally subdivides into the following principal topics: (1) those which concern the surroundings of man, such as the site of his dwelling, the air, the water he drinks, the character of his dwelling and its sanitation, and the general problem of disposal of sewage; (2) the prevention of disease; (3) the personal care of health, including diet, exercise, and clothing.

Soil. Soils may be moist or dry, permeable or impermeable, flat or sloping, etc. Their characteristics depend, aside from topography, upon the predominance of organic or inorganic constituents, water, and air. Loam contains much organic matter, many earthworms and innumerable bacteria. Deep soil is rarely contaminated with excrementitious matter. At a certain level, dependent upon the position of strata of clay and gravel, is a subterranean collection of water known as ground water. It represents the moisture that permeates the surface soil after that is saturated and reaches an impermeable soil upon which it firmly lies and from whence it is pumped or raised in wells. This subterranean sea is constantly in motion, vertically and horizontally. Its horizontal motion is towards the sea or the nearest watercourse. Its vertical motion is determined chiefly by rainfall. Much importance has been attached to it, and the following points may be considered as accepted: (1) a permanently high ground water, i.e., within 5 feet of the surface, is bad, while a permanently low ground water, i.e., more than 15 feet from the surface, is good; and (2) violent fluctuations are bad, even with an average low ground water; a comparatively high ground water with moderate and slow fluctuations may be healthful. The ground water determines the spread of certain forms of disease. The rain water, in the act of passing through the upper strata of earth, carries with it a mass of organic matter as well as a host of bacteria and disease germs, of which it is robbed as it sinks to the deepest soil. If well water be augmented by ground water which leaches in at high level, it will be contaminated and polluted. Healthy soils are the granites, metamorphic rocks, clay slate, limestone, sandstone, chalk, gravel, and sand; unhealthy are clay, sand, and gravel, with clay subsoil, alluvial soil, and marsh lands. Among the unhealthy soils ought also to be included all made soils, particularly those that are formed so often in towns from rubbish of all sorts. Such soils ought not to be occupied as building sites for at least two years.

Sites. The proper site for a dwelling is upon a permeable, porous soil, through which rain may easily filter and into which it may carry organic matter from the surface; a soil which has a low ground-water level and which retains but little dampness; a soil which admits of free circulation of atmospheric air with the ground air; a soil that does not admit of collections of standing water and that has slope enough to insure drainage. Where soil cannot be selected paving and tree planting correct many evils. Paving prevents the diffusion of ground air and the entrance of sewage or contaminated rain water. Trees absorb carbonic acid gas and moisture and yield oxygen, which in turn assists chemical conversion of organic matter. Cementing of cellars and laying dampproof materials upon foundations before erecting walls are also protective measures against dampness and pollution. In wet localities or in settlements necessarily built for commercial reasons near marshy land, through subsoil drainage by means of trenches or drain tile, the level of the ground water may be lowered to a safe position. See DRAINAGE.

Air. Air is the prime requisite for existence, and upon its purity depends to a large extent the growth, development, and health of animal life. Saturation of the atmosphere with water is called 100 per cent humidity. Average health demands a humidity of from 65 to 75 per cent, the lowest amount of aqueous vapor in the air being 35 per cent. Impurities in the air are from various sources. Air is vitiated by respiration, combustion of fuel or of illuminating gas, decaying vegetable or animal water, and by gases arising from manufacturing and various occupations. Expired air contains 100 times more carbonic acid and nearly 5 per cent less oxygen than ordinary atmospheric air. Factories, etc., add dust, chemical vapors, and volatile substances to the air. Small amounts of impurity do a little damage to health, large amounts undermine it. Hence ventilation becomes necessary. See HEATING AND VENTILATION.

Water. The atmosphere is the source of water supply. The vapor of water therein is condensed and falls in the form of rain, snow, or dew. Rain obviously must carry down with it the impurities in the atmosphere—gases, dust, and bacteria. It must cause deeper deposition of organic matter as it passes into the soil. It becomes either surface water augmenting the streams or ground water supplying wells and subterranean reservoirs. Impure water carries the germs of many diseases, as typhoid fever, dysentery, and cholera. The pollution of surface water by the entrance of sewage and of decomposing organic matter is a prevalent cause of disease. See FILTER AND FILTRATION; also WATER PURIFICATION; WATER SUPPLY; WATER WORKS.

Dwellings. Besides the site of a dwelling

and the desirability of its freedom from dampness and ground air, a house for living or for business purposes should give access to an abundance of sunlight. The materials of which houses are built are various. Probably the best is well-burnt brick. Dryness must be secured. Nonabsorbent surfaces internally are important. Paint that can be washed is better than paper. Ceilings ought to be impervious as well as walls, and floors ought to be made of well-fitting seasoned wood, calked and oiled or varnished so as to make them water-tight. Arrangements should be made for change of air once in three hours, if conditions of constant change do not exist. The warming of houses is of exceeding importance. See HEATING AND VENTILATION.

Scrupulous attention to cleanliness is necessary in dwellings, and there is wisdom in the use of rugs or loose carpets which may be removed daily and cleaned. Dust is a danger, for it forms a nidus for disease germs. Closely allied to the ordinary cleaning of the interior of dwellings is the problem of the removal of excreta, waste, and garbage. In most cities all the waste is either burned and destroyed or freighted out and dumped into the sea or some large body of water. Sanitation is concerned with the disposal of garbage. See GARBAGE AND REFUSE, DISPOSAL OF; SEWAGE DISPOSAL; PLUMBING.

Industrial Hygiene. One of the most important sanitary movements that has developed in late years is that of industrial hygiene. The influence of occupation on the health of workers and on the mortality among them is of profound importance. The sanitary conditions surrounding artisans are now receiving the notice of state and national governments to an ever-increasing extent, and employers are obliged to surround the workers with every precaution for safety to life and limb, to prevent ill health among them and insure them against disability.

The final report of the Commission on Industrial Relations, created by Act of Congress in 1912, was issued late in 1915, and showed, among other things, that, while accident prevention had been receiving much attention, yet accidents were responsible for only one-seventh as much destitution as sickness. Of the thirty million wage earners in the United States each loses an average of nine days a year through sickness; and the total sick bill, including wages lost and medical care, amounts to about $680,000,000 a year. Of cases requiring charitable relief, 30 to 40 per cent are due to sickness and this in turn is primarily due to poverty and its concomitants—bad housing, insufficient diet and inadequate clothing. The majority of workers do not earn enough to live in a sanitary manner. The most important recommendation of the commission is a national system of sick insurance; the right of the Federal government to tax industries for the support of such a system was established in 1798, when the law taxing registered vessels for the support of the Marine Hospital Service was passed. For other aspects of this question, see OCCUPATIONAL DISEASES.

School Hygiene. Of great importance is the modern development of school hygiene and the sanitary inspection of schools. A large proportion of the ill health of the community is found in children attending school; and their collection in large bodies renders imperative the prompt exclusion of individuals suffering from contagious or infectious diseases. It also offers opportunity for the prevention and remedy of chronic and developmental ailments which may later have a malign influence on the individual's health. School hygiene at the present day, in large communities, includes the selection of the site with reference to drainage, soil, air, light, the construction of the building itself, its ventilation, floor space and cubic space for each child, position of blackboards, water supply and sewage disposal, the attitude of the child while at his desk, besides the purely medical inspection already noted. See SCHOOLS, MEDICAL INSPECTION OF.

Prevention of Disease. Much here depends upon knowledge of the ætiology or the remote causes of disease. The best rule for preventing diseases is to follow out carefully the principles of general hygiene (q.v.) with reference to pure air, pure water, proper food, cleanliness, etc. Provision may be made against certain diseases. Malaria (q.v.) may be prevented by destroying mosquitoes and depriving them of their breeding places as well as by screening doors and windows of houses in malarial districts. Smallpox may be prevented by persistent revaccination. (See VACCINATION.) Typhoid fever may be prevented by boiling all water before it is drunk or used in cooking, by cooking oysters thoroughly, by most scrupulous drenching of all raw vegetables which may have been watered with liquid manure, and by preventing insects from gaining access to typhoid patients' dejecta or clothing before thorough disinfection has been practiced. For the protection of soldiers and others who may be unavoidably exposed to infection, antityphoid vaccination has proved a most reliable measure. (For the diseases transmitted through the agency of insects, most of them preventable, see INSECTS, PROPAGATION OF DISEASE BY.) In most large cities compulsory notification to the board of health is legal in the case of cholera, yellow fever, plague, smallpox, chicken pox, diphtheria (including membranous croup), typhus, typhoid, tuberculosis, measles, and spotted, relapsing, and scarlet fevers, all of which are considered contagious except typhoid. Isolation is practiced in all these diseases, partial or absolute. Much stress has been laid upon disinfection as a means of preventing disease, but it is a mistake to place too implicit reliance upon it. See DISINFECTANTS.

Disposal of the Dead. Putting aside the visionary schemes for turning the dead to commercial account, there are three methods of disposing of our dead to be considered, viz., burial in land, burial in water, and cremation. At present the question is not urgent, but it may become so in a century or two if the population continues to increase at the present rate. Even in our own time a great change has taken place, and the objectionable habit of interments in and around churches in towns has been abandoned, cemeteries in the country being now commonly employed, except in the case of country villages. The air over cemeteries is, however, always contaminated, and water percolating through them is unfit for drinking purposes. These evils are lessened by making the grave as deep as possible and by placing not more than one body in one grave. Plants should be freely introduced into every cemetery for the absorption of organic matters and of carbonic acid; and the most rapidly growing trees and

shrubs should be selected in preference to the slowly growing cypress and yew. The superficial space which should be allotted to each grave varies in different countries from 30 to 90 feet; the depth should at least be 6 feet. It is required by law that grave spaces for persons above 12 years of age shall be at least 9 feet by 4, and those for children under 12 years, 6 feet by 3. It is likewise required that not less than 4 feet of earth should be placed over the coffin of an adult and 3 feet above that of a child. The time which should elapse before a grave is disturbed for a new tenant varies with the soil and the distance of the body from the surface. Under favorable circumstances a coffin containing an adult will disappear with its contents in about 10 years, while in a clayey or peaty soil it may remain for a century. As for cremation, the expense is greater than burial at sea. The last method has the advantage that the body goes at once to support other forms of life more rapidly than in the case of land burial and without danger of evolution of hurtful products. See BURIAL; CREMATION OF THE DEAD.

Diet. Although about 70 elementary substances are known to chemists, only a comparatively small number of these take part in the formation of man and other animals, and it is only this small number of constituents which are essential elements of our food. These elements are, in the order of their abundance, oxygen, carbon, hydrogen, nitrogen, calcium, phosphorus, chlorin, fluorin, sulphur, potassium, sodium, magnesia, and iron, with traces of silicon, lithium, and manganese.

Carbon, hydrogen, nitrogen, and oxygen are supplied to the system by the proteid group of alimentary principles (see DIET)—viz., albumin, fibrin, and casein, which occur both in the animal and vegetable kingdoms, and the gluten contained in vegetables. Animal flesh, eggs, milk, corn, and many other vegetable products contain one or more of these principles. The gelatinoid group also introduces the same elements into the system, when such substances as preparations of gelatin, calves' feet, etc., are taken as food. Carbon, hydrogen, and oxygen are abundantly introduced into the system by the carbohydrate group in the form of sugar or starch (which occur in large quantity in the cereal grains, leguminous seeds, roots, tubers, etc., used as food), and also by organic acids (which, as citric, malic, tartaric acid, etc., occur in numerous vegetables employed as food). Carbon, with hydrogen and oxygen, occurs abundantly in the fatty group of alimentary principles, as, e.g., in all the fat, suet, butter, and oil that are eaten; in the oily seeds, as nuts, walnuts, coconuts, etc.; and in fatty foods, as liver, brain, etc. Phosphorus is supplied to us by the flesh, blood, and bones used as food, and in the form of various phosphates it is a constituent of many of the vegetables used as food. The system derives its sulphur from the fibrin of flesh, the albumen of eggs, and the casein of milk, from the vegetable fibrin of corn, etc., from the vegetable albumin of turnips, cauliflowers, asparagus, etc., and from the vegetable casein of peas and beans. Most of the culinary vegetables contain it. Chlorine and sodium, in the form of chloride of sodium, are more or less abundantly contained in all varieties of animal food and are taken separately as common salt. Potassium is a constituent of both animal and vegetable food; it occurs in considerable quantity in milk, and in the juice that permeates animal flesh; and most inland plants contain it. We derive the calcium of our system from flesh, bones, eggs, milk, etc. (all of which contain salts of lime); most vegetables also contain lime salts; and another source of our calcium is common water, which usually contains both bicarbonate and sulphate of lime. Magnesium in small quantity is generally found in those foods that contain calcium. Iron is a constituent of blood found in meat; and it occurs in smaller quantity in milk, in the yolk of egg, and in traces in most vegetable foods. Fluorin occurs in minute quantity in the bones and teeth, and is obtained from the traces of fluorin found in milk, blood, etc.

Drinks are merely liquid foods. They include mucilaginous, farinaceous, or saccharine drinks—as toast water, barley water, gruel, etc., which are very slightly nutritive and differ but little from common water; aromatic or astringent drinks—as tea, coffee, chocolate, and cocoa, the last two of which contain a considerable quantity of oil and starch; acidulous drinks—as lemonade, ginger beer, raspberry-vinegar water; drinks containing gelatin—the broths and soups, which, if properly prepared, should contain all the soluble constituents of their ingredients; emulsive or milky drinks—as animal milk, the milk of the coconut, and almond milk, a drink prepared from sweet almonds (animal milk contains all the essential ingredients of food, the others are slightly nutritive); alcoholic and other intoxicating drinks—including malt liquor or beer in its various forms of ale, stout, and porter; wines; spirits in their various forms of brandy, rum, gin, whisky. Whether alcoholic drinks constitute food is debatable.

Excluding salt, which must be considered as a saline alimentary principle, the most common condiments, such as mustard, capsicum (Cayenne pepper), pepper, the various spices, etc., owe their action to the presence of a volatile oil. Condiments and sauces afford little or no nutrition. They do, however, exert special action on the nervous system to stimulate secretion and also to retard tissue change and waste. Any more than a very moderate use is likely to impair the digestion and nutritive processes. Salt has a special value in promoting diffusion through the animal membranes and in bringing some of the alimentary principles into solution. Its decomposition probably furnishes the hydrochloric acid to the gastric juice. (For a general discussion of the preparation of foods, see COOKERY; and in this connection see, also, ADULTERATION and FOOD.) Salted meat is, in so far as nutrition is concerned, in much the same state as meat from which good soup has been made. For a discussion of the preservation of food, see ANTISEPTIC; FOOD; FOOD, PRESERVATION OF.

The method of refrigeration is, on a small scale, familar to every one by the use of ice in the ordinary household refrigerator. (See REFRIGERATION.) The method of drying—evaporation of water by sun heat or in ovens—is largely applied to meats and to fruits and vegetables. Foodstuffs so treated reabsorb moisture and deteriorate after a time. Certain fruits, as raisins, figs, and dates, are very palatable after such treatment. The method of exclusion of air, sometimes called Appert's method from its inventor (François Appert, q.v.), is applied to every kind of perishable food and constitutes

one of the great industries of the world. It consists in subjecting the article to be preserved to a temperature sufficient to destroy the germs which cause decomposition, and then putting it into tins or jars, which are immediately made air-tight. This principle is applied in the familiar canning of vegetables and fruits.

The method of antiseptics finds application chiefly in the use of smoke, sugar, salt, alcohol, vinegar, and saltpetre.

The pecuniary economy of various foods has been the subject of much investigation in Europe and in the United States. Protein is an essential food, since from no other source can the animal obtain nitrogen; it is also much the costliest. Protein in its most economic form is found in such foods as oatmeal, beans, potatoes, and wheat flour. See FOOD.

Exercise. The most important effect of muscular exercise is produced in the lungs, the quantities of inspired air and of exhaled carbonic acid being very much increased. Almost twice as much carbonic acid is exhaled during exercise as during rest. Hence muscular exercise is necessary for the due removal of the carbon. The effect of exercise on the mind, as on the body, is beneficial. Digestion is improved by exercise. The appetite increases, and nitrogenous substances, fats, and salts, especially phosphates and chlorides, are required in greater quantity than in a state of rest. The change of tissues is increased by exercise. The muscles require much rest for their reparation after exercise, and they then absorb and retain water, which seems to enter into their composition. The old rule, held by trainers, of allowing only the smallest possible quantity of fluid, is wrong. See EXERCISE; GYMNASTICS; PHYSICAL EDUCATION.

Clothing. The object of clothing is to preserve the proper heat of the body by protecting it from both cold and heat and thus to prevent the injurious action of sudden changes of temperature upon the skin. The most important materials of clothing are cotton, linen, wool, silk, leather, and India rubber. Cotton, as a material of dress, wears well, does not rapidly absorb water, and conducts heat much less rapidly than linen, but much more rapidly than wool. Its main advantages are cheapness and durability. In merino it is mixed with wool in various proportions, and this admixture is far preferable to unmixed cotton. Linen is finer in its fibres than cotton and hence is smoother. It possesses high conducting and bad radiating powers, so that it feels cold to the skin; moreover, it attracts moisture much more than cotton. For these reasons cottons and thin woolens are much preferred to linen garments in warm climates. Silk forms an excellent underclothing, but from its expense it has never come into general use. Wool is superior both to cotton and linen in being a bad conductor of heat and a great absorber of water, which penetrates into the fibres and distends them (hydroscopic water) and also lies between them (water of interposition). During perspiration the evaporation from the surface of the body is necessary to reduce the heat which is generated by exercise. When the exercise is concluded, evaporation goes on and to such an extent as to chill the body. When dry woolen clothing is put on after exertion, the vapor from the surface of the body is condensed on the wool and gives out again the large amount of heat which had become latent when the water was vaporized. Therefore a woolen covering, from this cause alone, at once feels warm when used during sweating.

In relation to protection against heat we have to consider the color and not the texture of clothing. White is the best color, then gray, yellow, pink, blue, and black.

Personal Cleanliness. Attention to the state of the skin is of great importance. The perspiration and sebaceous matters which are naturally poured out upon the surface of the body, with an intermingling of particles of detached epidermis, fragments of fibres from the dress, dirt, etc., if not removed, gradually form a crust which soon materially interferes with the due excreting action of the skin. There is little doubt that the daily bath, which less than half a century ago was unknown and is now a habit with those who can get it, has contributed materially to the preservation of health. See HYGIENE.

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SANITARY SERVICE, MILITARY. See HYGIENE, *Military Hygiene.*

SANITATION, MILITARY. See HYGIENE, *Military Hygiene;* SANITARY SCIENCE.

SAN JACIN'TO, BATTLE OF. The final battle in the war for Texan independence, fought near San Jacinto Bay, Tex., April 21, 1836, between about 740 Texans, under General Houston, and about 1400 Mexicans, under Santa Anna. On April 20 the opposing forces took up positions about 1 mile apart, and after some preliminary skirmishing the battle took place on the afternoon of the following day. It was hardly more than a sharp charge by the Texans, who rushed on with the cry "Remember the Alamo" and quickly overcame the Mexicans. Santa Anna fled, but was captured the next day. The Texans lost only about 25 in killed and wounded, the Mexicans, 1360 in killed, wounded, and captured.

SAN JIL. See SAN GIL.

SAN JOAQUIN, săn hō'ä-kēn'. A town of Panay, Philippines, in the Province of Iloilo, situated on the coast, about 30 miles southwest of Iloilo. Pop., 1903, 14,333.

SAN JOAQUIN (săn wä-kēn') **RIVER.** A river of California, draining the southern half of the great central valley between the Coast Range and the Sierra Nevada (Map: California, D 5). It rises in the high Sierra south of the Yosemite National Park, flows southwestward to the trough of the San Joaquin valley and then northwestward until it empties into Suisun Bay. Its total length is about 350 miles—125

miles in the mountains and 225 miles in the valley. (See DAMS AND RESERVOIRS.) It receives numerous tributaries from the mountains on either side, one of which, the Merced, flows through the famous Yosemite valley. The San Joaquin is navigable at all seasons to Stockton, 50 miles.

SANJO SANÉYOSHI, sän′jō′ sä-nā′yō-shē (1836–91). A Japanese statesman, born at Kyoto of the Fujiwara princely family. He was originally antiforeign, and in 1863 he was sent by the Mikado to Yeddo to demand reform and more vigorous government. The Shogun's party in Kyoto triumphing, Sanjo and six other nobles fled to Choshu. After three years' exile, having become converted to liberal views, he returned to Kyoto, was made Vice-Administrator and Junior Prime Minister, and in 1870 Premier (*dajo daijin*), an office which he held until 1886, when he was made Chancellor.

SAN JOSÉ, hō-sā′. The capital of Costa Rica, situated 44 miles east of Puntarenas, on the Pacific coast (Map: Central America, E 6). It is located in a beautiful valley, is regularly built, with broad macadamized streets crossing at right angles, and is lighted by electricity. There are several fine squares containing parklike gardens. The most prominent buildings and institutions are the cathedral, the National Museum, the school of law, a seminary, the National Library, and the Institute of Physical Geography. The elevation of the town above the sea is 3868 feet. It has a temperate climate and a good water supply. It is the centre of a rich agricultural region and the principal station on the transcontinental railroad from Limón to Puntarenas. Pop., 1913 (est.), 33,900. San José was founded in 1738 and became the capital of Costa Rica on the establishment of independence in 1823.

SAN JOSÉ. The principal seaport on the Pacific coast of Guatemala, situated 54 miles southwest of the city of Guatemala, with which it is connected by rail (Map: Central America, B 4). The harbor is provided with an iron pier and is a station for several lines of steamers. The town exports coffee, sugar, cotton, dyestuffs, and lumber. Pop. (est.), 1500.

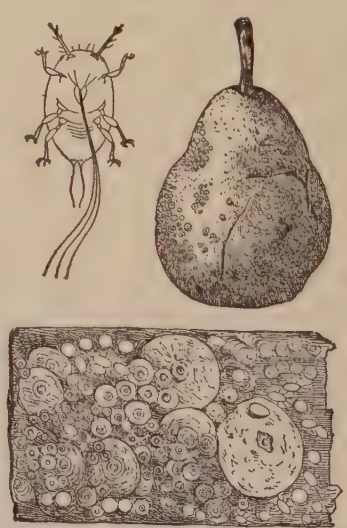
SAN JOSÉ. A town of Luzon, in the Province of Batangas, Philippine Islands. It lies 7 miles north of Batangas on the Manila-Batangas Railroad. Pop., 1903, 8996.

SAN JOSE, săn hō-sā′, *or, colloq.,* săn ō-zā′. A city and the county seat of Santa Clara Co., Cal., 47 miles south by east of San Francisco, on the Southern Pacific Railroad (Map: California, D 5). It is situated in the beautiful Santa Clara valley and is a popular health resort. San Jose is the seat of the University of the Pacific (Methodist Episcopal), with handsome buildings and a campus covering 17 acres; the College of Notre Dame, a Roman Catholic institution, opened in 1851; and a State Normal School. Noteworthy also are the city hall, courthouse, Hall of Justice, Y. M. C. A., Y. W. C. A., Hall of Records, the post-office building, and the high-school building. The city has two public libraries, one a Carnegie library. There are two parks, St. James and the City Hall Park. Alum Rock Park, 7 miles distant, with its mineral springs and picturesque scenery, and the Lick Observatory (q.v.), on the summit of Mount Hamilton, 25 miles to the east, attract many visitors. San Jose is the centre of a region which produces large quantities of prunes, apricots, peaches, cherries, grapes, olives, wheat, and barley. It is an important fruit packing and shipping point, the fruit exports being valued at between $10,000,000 and $15,000,000 annually; and also ranks high industrially. There are foundries, fruit canning and drying establishments, marble works, and manufactories of wine and malt liquors, leather, windmills, etc. The city has adopted the commission form of government. Pop., 1900, 21,500; 1910, 28,946; 1915, 37,994; 1920, 39,604. The Pueblo de San José de Guadalupe was founded here in 1777, and the Mission of San Jose was established near by in 1797. In 1846 a small force took possession for the United States, and from 1849 to 1851 San Jose was the capital of California. Consult Hall, *History of San José and Surroundings* (San Francisco, 1871), and Mars, *Reminiscences of Santa Clara Valley and San José* (ib., 1901).

SAN JOSÉ DE BUENAVISTA, săn hō-sā′ dā bwā′nä-vēs′tä. The capital of the Province of Antique, in Panay, Philippines (Map: Philippine Islands, C 5). It is on the coast in the southern part of the province, is a port of entry, and has an active coasting trade with Iloilo. Pop., 1903, 6768.

SAN JOSÉ DE CÚCUTA, kōō′kōō-tä, or simply CÚCUTA. The capital of the Department of Norte de Santander, Colombia, situated on the Táchira, near the Venezuelan frontier (Map: Colombia, C 2). It is a centre of trade between Colombia and Venezuela. The chief export is coffee. An earthquake destroyed the town in 1875. Pop., 1912, 20,364.

SAN JOSE SCALE. An hemipterous insect (*Aspidiotus perniciosus*) of the family Coccidæ. (See SCALE INSECT.) It derives its popular name from San Jose, Cal., where Comstock dis-



SAN JOSE SCALE.

A young larva; a pear covered with scale insects; and the scales, enlarged.

covered and named it in 1880. It has been considered the most pernicious scale insect in the United States, whence the specific name. It was probably introduced at San Jose about 1870 on trees imported from China by James Lick.

By 1890 it had spread over the greater part of California, but was not recognized east of the Rocky Mountains until August, 1893, when it was found by Howard on a pear received from Charlottesville, Va. Soon afterward the discovery was made that in 1887 or 1888 infested nursery stock had been brought from California by two New Jersey nurseries and that unwittingly nursery infested stock had been sent out broadcast. By 1895 the pest had become established in many nurseries and orchards in the majority of the Eastern States, and in February, 1898, the German government prohibited the importation of American fruits and plants to prevent the introduction of the scale. Other European governments, Canada, and South Africa soon after issued similar decrees. It is now known in Japan, China, and Australia and in almost every one of the United States, seeming to reach its greatest powers of destruction in the best fruit-growing regions.

The San Jose scale does not occur upon citrus fruits, but has attacked the limbs, leaves, and fruit of more than 150 species of food plants, including the principal deciduous fruit and ornamental trees and shrubs. When the infestation is very bad, the scales lie close together upon the bark, frequently overlapping, the young scales clustering over the surface of the older individuals. The general appearance of a twig covered with the scales is of a grayish, slightly roughened, scurfy deposit. Infested apple and pear fruits show a reddish discoloration of the skin and, when severely attacked, become distorted, rough, pitted, and frequently cracked. Well-grown apple trees are resistant for several years, but young peach trees are often killed in two seasons. The money lost to the orchard interest of the United States from the work of this insect has been enormous.

The winter is passed by the nearly full-grown insects under the protection of the scale. In the early spring the hibernating males emerge, and in May the females mature and begin to give birth to young at the daily rate of perhaps 9 to 10 young by each mother for a period of six weeks. It is estimated that the offspring during the summer from a single overwintering female may amount to more than 1,500,000,000. Distribution is mainly by means of nursery stock, but is also upon fruit. The young are also carried upon the feet of birds and flying insects. Wind also has some effect on the distribution. None of the native national enemies appear to be very effective, although a chalcidid fly (*Aphelinus fuscipennis*) destroys the adults. The Chinese ladybird (*Chilocorus similis*), introduced by Marlatt, may prove a more effective natural enemy. See LADYBIRD.

The principal remedies in use are treatment with a mixture of lime, sulphur, and salt, known as California wash, with whale oil or fish oil soap, preferably made with potash lye; with a kerosene-soap emulsion or with crude petroleum; with a mechanical mixture of kerosene and water; and with hydrocyanic acid gas. The last-named treatment is now used only for nursery stock, although extensive experiments have been made with orchard trees.

Consult numerous articles by L. O. Howard, C. L. Marlatt, A. L. Quaintance, and others, on the San Jose scale, published by the United States Bureau of Entomology (Washington, 1896 et seq.); W. G. Johnson, *Fumigation Methods* (New York, 1902); United States Department of Agriculture, *The Farmers' Bulletin, No. 650* (Washington, 1915), and the publications of the State agricultural experiment stations.

SAN JUAN, hwän. A province of west Argentina (Map: Argentina, F 4). Area, 35,935 square miles. It is traversed in the west by a number of parallel mountain chains belonging to the Andes, which inclose fertile valleys. The eastern portion is level and covered for a large part by a saline steppe and arid tracts. Gold and silver are mined to some extent, and other minerals are believed to exist in large quantities. Cattle raising and wine production are the chief industries. Agriculture is not much developed; the principal products are wheat, corn, lucern, and olives. Pop., 1912 (est.), 125,867. Capital, San Juan (q.v.).

SAN JUAN. The capital of the Province of San Juan, Argentina, situated on the San Juan River, 85 miles north of Mendoza, with which it has railroad connection (Map: Argentina, F 4). It is a clean and well-built town, well paved and drained, and provided with public baths. It has a national college, a normal school, and a large seminary. The wine trade is important, and the town exports cattle to Chile. Pop., 1912 (est.), 14,000. An earthquake in 1894 destroyed a large part of the city.

SAN JUAN. A town of Luzon, Philippines, in the Province of La Unión, situated on the coast, 3 miles north of San Fernando. Pop., 1903, 11,223.

SAN JUAN (full name SAN JUAN BAUTISTA DE PUERTO RICO). The capital of Porto Rico, situated on a small coral island towards the east end of the north coast (Map: Porto Rico, E 1). The islet is about 2½ miles long and ½ mile wide and is connected with the mainland by the Bridge of San Antonio. The bay inclosed by it is spacious and deep and forms the best harbor of the island, though the narrow rocky entrance is dangerous in stormy weather. The town is surrounded by picturesque walls and towards the sea presents a line of fortified cliffs. On a promontory at the west end stands the Morro Castle, built in 1584, but well preserved. The streets are laid out in regular squares and are well paved and shaded.

On the Plaza de Santiago stands a statue of Ponce de León. There are a number of fine buildings, such as the city hall, the customhouse, the former Captain General's palace, the barracks, and the Casa Blanca, an interesting fortress-like building. There are also a cathedral and an immense Dominican convent. The defective water supply and sanitary arrangements have been improved since the American occupation. The city is increasing in commercial and industrial importance. Pop., 1899, 32,048; 1910, 48,716. San Juan was founded in 1511 by Ponce de León. It was strongly fortified and several times repulsed the attacks of English fleets. On May 12, 1898, during the Spanish-American War, its defenses were bombarded by the American fleet under Sampson, but the city was not occupied by the American forces until after the suspension of hostilities. For bibliography, see PORTO RICO.

SAN JUAN. See TANOAN STOCK.

SAN JUAN BAUTISTA, bou-tēs'tà. The capital of the State of Tabasco, Mexico, situated on the Grijalva River about 30 miles from the coast (Map: Mexico, N 9). It stands in a low and unhealthful locality and is of unpre-

tentious appearance. It controls the import and export trade of its port, Frontera, at the mouth of the river. It has local manufactures of brick and tile, soap, candles, cigars, rum, and hats. It was founded under the name Villa Felipe II in 1598, afterward called Villa Hermosa, and finally in 1821 was given its present name. Pop., 1900, 10,543; 1910, 12,327.

SAN JUAN BOUNDARY DISPUTE. A dispute between the United States and Great Britain in regard to a part of the Oregon boundary, which by the Treaty of June 15, 1846, was made the forty-ninth parallel to the "middle of the channel which separates the continent from Vancouver Island, and thence southerly through the middle of said channel and of Fuca Straits, to the Pacific Ocean." Afterward a difference of opinion arose between the two countries as to what channel was meant; the United States maintaining that it was the Canal de Haro, and Great Britain that it was Rosario Strait, so that it remained unsettled to which government Washington Sound and the islands in it belonged. An amicable arrangement was effected in 1859, by which the two governments jointly occupied the island, the United States having a garrison in the south and Great Britain in the north. The Treaty of Washington (1871), art. 34, referred the controversy to the Emperor of Germany, who decided for the United States in 1872.

SAN JUAN DE BOCBOC, bŏk-bŏk′. A town of Luzon, Philippines, in the Province of Batangas. It is situated on the Gulf of Tayabas, 25 miles east of Batangas. Pop., 1903, 11,853.

SAN JUAN DE LA CIÉNEGA, sĕ-ā′nâ-gȧ. See CIÉNEGA.

SAN JUAN DEL NORTE, nôr′tȧ, or GREYTOWN. A seaport on the Atlantic coast of Nicaragua, at the mouth of the northern arm of the San Juan River delta, in the extreme southeast corner of the Republic (Map: Central America, F 5). Greytown lies in an unhealthful locality. Formerly it had a good harbor, but neglect of the port works has allowed it to be refilled with sand. Pop., about 2500.

SAN JUAN DE LOS REMEDIOS, rȧ-mā′dĕ-ôs. See REMEDIOS.

SAN JUAN DEL RÍO, dĕl rē′ô. A town in the State of Querétaro, Mexico, 27 miles east of the city of that name (Map: Mexico, J 7). It is noted for silver mining and for its trade in opals. It is an irregularly built town, founded in 1531. Pop., 1900, 8124; 1910, 7036.

SAN JUAN DEL SUR, dĕl sōōr. A seaport of Nicaragua, on the Pacific coast, 65 miles southeast of Managua (Map: Central America, D 5). Its harbor is small, but deep, and it is a submarine cable station and the port for Rivas. Pop. (est.), 1092.

SAN JUAN HILL. See SPANISH-AMERICAN WAR.

SAN JUAN RIVER. The outlet of Lake Nicaragua in Central America. It leaves the lake at its southeast end and flows 110 miles in a winding southeasterly course on the boundary between Nicaragua and Costa Rica, emptying into the Caribbean Sea through a delta of several arms (Map: Central America, E 5). The mouth of one of these forms the harbor of Greytown (San Juan del Norte). The river is broad, deep, and tranquil, but near the middle it is completely obstructed by the rapids of Machuca.

ŚANKARA, or **ŚANKARĀCĀRYA,** shän′kȧ-rȧ-chär′yȧ (c.788–c.820). A Hindu philosopher and commentator on the *Vedanta* (q.v.). According to tradition he was born in Malabar and died at Kedernath in the Himalaya. He was popularly regarded as an incarnation of Siva (q.v.) on account of his name Sankara, an epithet of Siva. An enormous number of works are attributed to him, most of which are probably spurious. He is an important figure in the history of Hindu philosophy because of his *Brahmasutrabhasya*, a commentary indispensable for an understanding of the *Brahmasutras* of Badarayana, the founder of the Vedanta school of philosophy (ed. at Bombay, 1890–91). Among the works attributed to him which have been recently published are: *Vedânta-Sutras*, translated by Thibaut (3 vols., Oxford, 1890–1904); *Atmabodha, or The Awakening to the Self*, translated by E. Johnston (New York, 1897); *Sarva-Siddhânta-Sangraha*, edited and translated by Raṅgâcârya (Madras, 1909); *Selected Works*, edited and translated by Venkataramanan (Madras, 1912). Consult: Deussen, *System des Vedânta* (Leipzig, 1883); id., *Sûtras des Vedânta* (ib., 1887); Dutta, *Sankarâchârya: His Life and Teachings* (3d ed., Calcutta, 1899).

SAN'KEY, IRA DAVID (1840–1908). An American evangelist, born at Edinburgh, Lawrence Co., Pa. He became a business man, active in Church work. In 1870 he met Dwight L. Moody (q.v.), and they became associated in revivalistic work. They visited Great Britain from 1873 to 1875 and again in 1883 and made many tours throughout the United States. In these meetings Sankey had charge of the singing. After severing his connection with Moody he frequently conducted meetings alone. In 1903 he became blind. His compilations of devotional music, containing many of his own compositions, are *Gospel Hymns* (1875); *Sacred Songs and Solos* (1873); *Young People's Songs of Praise* (1902). Consult E. Nason, *Lives of D. L. Moody and Ira D. Sankey* (Boston, 1887), and Sankey's *My Life and the Story of the Gospel Hymns* (Philadelphia, 1907).

SANKHYA, sän′kyȧ (Skt. *sānkhyā*, enumeration). The name of one of the six great systems of Hindu philosophy. It is complemented, deistically, by the *Yoga* (q.v.) system, and like the two *Mimamsas* (q.v.), the *Nyaya* (q.v.), and *Vâiśeshika* (q.v.) systems, it professes to teach the means by which eternal beatitude may be attained. This means is the discriminative acquaintance with *tattva*, or the true principles of all existence, and such principles are, according to the Sankhya system, the following 25: (1) *Prakriti* (q.v.) or *Pradhana*, the (intellectual) basis. Its first production is (2) Mahat, the great, or *Buddhi*, intellect, or the intellectual principle, which appertains to individual beings. From it devolves (3) *Ahamkara*, the assertion of the ego, the function of which consists in referring the objects of the world to the ego. This produces (4–8) five *tanmatras*, or subtle elements which themselves are productive of the five gross elements. (See 20–24.) Ahamkara further produces (9–13) five instruments of sensation, the eye, ear, nose, tongue, and skin; (14–18), five instruments of action, the organ of speech, the hands, feet, termination of the intestines, and organ of generation; lastly (19), *manas*, the organ of volition and imagination. The five gross elements are space or ether, which has the property of audibility and is derived from the sonorous tanma-

tra; air, which has the properties of audibility and tangibility and is derived from the aërial tanmatra; fire, which has the properties of audibility, tangibility, and color and is derived from the igneous tanmatra; water, which has the properties of audibility, tangibility, color, and savor and is derived from the aqueous tanmatra; lastly earth, which to the above properties unites odor and is derived from the terrene tanmatra. The twenty-fifth principle is *purusha* (q.v.), or soul. From the union of soul and Prakriti comes creation. Nature as matter is a product of intellect.

The soul's wish is fruition or liberation. In order to become fit for fruition the soul is in the first place invested with a *linga sarira*, or *suksma sarira*, a subtle body, which is composed of *Buddhi* (2), *Ahamkara* (3), the five *tanmatras* (4–8), and the 11 instruments of sensation, action, and volition (9–19). This subtle body is invested with a grosser body, which is composed of the five gross elements (20–24). The grosser body, propagated by generation, perishes; the subtle frame, however, transmigrates through successive bodies. Besides the 25 principles, the Sankhya also teaches that nature has three essential *gunas*, or characteristics: *sattva*, being, or goodness; *rajas*, energy, or passion; and *tamas*, darkness, the characteristic of sloth. The knowledge of the principles, and hence the true doctrine, is, according to Sankhya, obtained by three kinds of evidence, perception, inference, and right affirmation, which some understand to mean the revelation of the Veda and authoritative tradition.

The Sankhya in its first form is atheistical, but it underwent a mythological development in the *Puranas* (q.v), in the most important of which it is followed as the basis of their cosmogony. Thus, Prakriti, or nature, is identified by them with Maya (q.v.), and the *Matsya-Purana* affirms that Buddhi, the intellectual principle, through the three qualities, being, passion, and darkness, became the three gods, Brahma, Vishnu, and Siva. The most important development, however, of the Sankhya is that by the Buddhistic doctrine, which is mainly based on it. The Sankhya system is probably the oldest of the Hindu systems of philosophy, for its chief principles are, with more or less detail, already contained in the secondary *Upanishads* (q.v.).

The reputed founder of the Sankhya is Kapila, who is said to have been a son of Brahma, or else an incarnation of Vishnu. He taught his system in sutras (q.v.), which, distributed in six lectures, bear the name of *Sankhya-Pravacana*, though the antiquity of this work has been questioned. The oldest commentary is that by Aniruddha (trans. by Garbe, Calcutta, 1888–92); another is that by Vijnanabhikshu. The first summary of the Sankhya doctrine is given by Isvara Krishna, in his *Sankhya-Karika* (ed. and trans. by Wilson and Colebrooke, together with a translation of the commentary of Gaudapada, Oxford, 1837; new ed., Bombay, 1887).

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SANKT INGBERT, zängkt ĭng'bĕrt. A town of the Palatinate, Bavaria, Germany, 14 miles west of Zweibrücken. It has machinery, glass, and iron works and some coal mines. Pop., 1900, 14,048; 1910, 15,947.

SANKT JOHANN, yō-hän'. A town in the Rhine Province, Prussia, on the Saar, opposite Saarbrücken (Map: Germany, B 4). It is the shipping centre of the Saarbrücken coal-mining district and manufactures machinery, ironware, wire rope, etc. Pop., 1905, 24,140; in 1909 it became part of Saarbrücken (q.v.).

SANKT MORITZ. See SAINT MORITZ.

SANKT PÖLTEN, pēl'ten. An ancient town in Lower Austria, 38 miles by rail west of Vienna (Map: Austria, D 2). It has a bishop's seminary and a cathedral dating from 1030. Ironware, weapons, cotton, paper, glass, and stoneware are manufactured. Pop., 1900, 14,510; 1910, 21,700.

SAN LEANDRO, săn lē-ăn'drō. A city in Alameda Co., Cal., 15 miles from San Francisco, on the Southern Pacific and the Western Pacific railroads. It has a public library and there are lumber mills and hay-press works. Pop., 1900, 2253; 1910, 3471.

SAN LORENZO DEL ESCORIAL, săn lō-rĕn'thō dĕl ĕs-kō'rĭ-ăl'. See ESCORIAL.

SAN LÚCAR DE BARRAMEDA, săn lōō'-kär dā bär'rä-mā'dhä. A town of south Spain, in the Province of Cadiz, situated among the dunes at the mouth of the Guadalquivir, 16 miles north of Cadiz (Map: Spain, B 4). It is a popular bathing resort. The vines covering the surrounding dunes produce the excellent Manzanilla wine. There are salt works and flour mills, and dynamite is manufactured in the neighborhood. The port is Bonanza, situated 2½ miles up the river; it is provided with a large iron pier and connected by rail with Jérez. In 1498 Columbus sailed hence to cross the Atlantic, and hence, too, in 1519 Magellan sailed on his voyage around the world. Pop., 1900, 23,747; 1910, 22,645.

SAN LÚCAR DE BARRAMEDA, DUKE OF. See OLIVARES, GASPAR DE GUZMÁN.

SAN LUCAS, CAPE. See CAPE SAN LUCAS.

SAN LUIS, lōō-ēs'. A central province of Argentina (Map: Argentina, F 4). Area, estimated at 29,034 square miles. The surface is mountainous in the north, where there are also some saline steppes. The rest of the province is level, but sparsely watered. The Río Salado runs along the west boundary. The climate is very dry, temperate, and healthful. Much of the land is unsuited for agriculture unless irrigated. Stock raising is carried on extensively. The extensive mineral deposits include copper, gold, iron, graphite, and other minerals. Gold and copper mines only are exploited to any extent. Pop., 1912 (est.), 112,898. Capital, San Luis (q.v.).

SAN LUIS, or SAN LUIS DE LA PUNTA. The capital of the Province of San Luis, Argentina, situated at the south end of the Sierra de San Luis, 140 miles southeast of Mendoza (Map: Argentina, F 4). It has a national college and a normal school. Its water supply, as well as

the water used in irrigating the surrounding district, is derived from an immense artificial reservoir. The town is noted for the manufacture of ponchos and exports horses, hides, and vicuña wool. Pop., 1912 (est.), 11,000.

SAN LUIS. A town of Luzon, Philippine Islands, in the Province of Pampanga, on the Rio Grande de Pampanga, about 10 miles northeast of Bacolor. Pop., 1903, 10,067.

SAN LUISEÑO. See LUISEÑO.

SAN LUIS OBISPO, săn lōō'ĭs ō-bĭs'pō. A city and the county seat of San Luis Obispo Co., Cal., 225 miles northwest of Los Angeles, on the Southern Pacific and the Pacific Coast railroads (Map: California, E 7). It contains the California Polytechnic School, the Mission of San Luis Obispo (founded by Father Junipero Serra in 1772), a Carnegie library, an Elks home, a Masonic Temple, and excellent public schools. There are in the city division headquarters and shops of both railroads. Pop., 1900, 3021; 1910, 5157.

SAN LUIS POTOSÍ, săn lōō-ēs' pō'tō-sē'. An inland state of Mexico (Map: Mexico, J 6). Area, 25,316 square miles. The greater part lies within the great Mexican plateau, but near the southeast corner the plateau falls steeply several thousand feet to the low valley of the Pánuco River. The climate is healthful in the elevated parts and hot and unhealthful in the lowlands, where fever prevails. The surface is abundantly wooded, and the soil is very fertile in the valleys, but agriculture is undeveloped. Tropical fruits are grown. Stock raising also is carried on. Mining has been revived and is now a leading industry. The chief products are gold, silver, copper, lead, zinc, iron, quicksilver, and petroleum. Commerce and manufactures are increasing, and the state is one of the richest and most progressive in the Republic. The capital is San Luis Potosí (q.v.). Pop., 1910, 627,800, including a large proportion of Indians.

SAN LUIS POTOSÍ. The capital of the State of San Luis Potosí, Mexico, situated on the plateau at the head of the valley of the Verde, 215 miles northwest of Mexico City and 6200 feet above sea level (Map: Mexico, J 7). It is almost hidden by luxuriant gardens and is regularly laid out, with broad streets and numerous plazas, on one of which is a marble fountain surmounted by a statue of Hidalgo. On the principal square stands the handsome cathedral and the fine city hall. Other notable buildings are the courthouse, the Governor's palace, the mint, and the Alarcón Theatre. The city is an important railroad centre. It has had a rapid commercial and industrial development. Its principal manufactures are woolen goods, furniture, matches, flour, soap, iron and brass, shawls, and cigars. It exports pottery, mineral products and hides and is the seat of the United States Consul. It is the fourth city in size in the Republic, with a population of 82,946 in 1910. It derives its original importance from the famous silver mines in the neighboring Cerro de San Pedro, discovered in 1583. Here in 1910 Madero issued his plan, which started the successful revolt against the Díaz régime. The city was captured by the Constitutionalists in 1914.

SAN MARCO IN LAMIS, săn mär'kō ĭn lä'mēs. A town in the Province of Foggia, Italy, on the southwest slope of Monte Gargano, 18 miles north by east of Foggia (Map: Italy, E 4). Cereals and fruits are produced, and wine and olive oil are manufactured. Pop. (commune), 1901, 17,309; 1911, 18,105.

SAN MARCOS, săn mär'kŏs. A city and the county seat of Hays Co., Tex., 50 miles northeast of San Antonio, on the International and Great Northern and the Missouri, Kansas, and Texas railroads (Map: Texas, D 5). It contains a State normal school, Baptist Academy, Coronal Institute, and a United States fish hatchery. Cotton, onions, and cattle are raised extensively, and there are a cotton gin and oil mill. Pop., 1900, 2292; 1910, 4071.

SAN MARINO, mä-rē'nō. A republic in the peninsula of Italy, between the provinces of Forlì and Pesaro-Urbino, near the Adriatic coast, 12 miles southwest of Rimini (Map: Italy, D 3). Area, about 38 square miles; pop., 1910, 10,489. It is the oldest state in Europe and one of the smallest in the world. The district is hilly, the highest point being Monte Titano (about 2650 feet). The climate is healthful. Cattle raising and wine production are the chief occupations. Stone figures among the exports. The uninteresting town of San Marino is situated on Monte Titano and is protected by a wall. It has five churches and a fine Parliament house. The governing laws—the Statuta Illustrissimæ Reipublicæ—date from the Middle Ages. In 1847 the ruling Grand Council was transformed into a representative chamber, with 60 life members, chosen from the burghers, landowners, and the nobility. Two members from this chamber are selected every six months as "reigning captains." From this council an executive council of 12 is chosen yearly. San Marino has a treaty of friendship with Italy. There is no public debt. The annual revenue and expenditure of the Republic amounted in 1914 to $193,541 and $125,232 respectively.

History. The city of San Marino, said to have been founded in the fourth century by St. Marinus of Dalmatia, formed part of the Byzantine Exarchate of Ravenna and, after an uneventful existence under Lombard and Frankish rule, gradually established its independence with the aid of the counts of Montefeltro. In 1631 it received a formal acknowledgment of its independence from Pope Urban VIII. Napoleon did not deign to tamper with the liliputian Republic, and sentiment probably led to the preservation of its identity in 1860–61, on the formation of the Italian Kingdom, under whose protection the Republic placed itself in 1862; since 1860 it has been in a technical state of war with Austria, and in 1914 it joined the allies against the Central Powers in the European War. Consult: P. Franciosi, *Garibaldi e la repubblica di San Marino* (Bologna, 1891); H. Hauttecœur, *La république de San Marino* (Brussels, 1894). See WAR IN EUROPE.

SAN MARTÍN, săn mär-tēn', JOSÉ DE (1778–1850). A South American general, distinguished for his services in the war of independence against Spain. He was born at Yapeyú in Argentina, Feb. 25, 1778, and as a child was sent to Spain, where he received his education. He entered the army and served with distinction against the French. In 1811 he laid down his rank of lieutenant colonel and in the following year went to Buenos Aires, where he threw in his fortunes with the patriot cause. In January, 1813, he defeated the Spanish Viceroy at San Lorenzo and in the following

year was placed in command of the insurgent army in Upper Peru. San Martín now conceived the design of destroying the Spanish power by overrunning Chile and then striking at the stronghold, Peru. After two years' preparation he set out in January, 1817, from Mendoza, with a well-drilled army of 4000 men, crossed the Andes with much hardship and on February 12 routed the Spaniards at Chacabuco. This led to the occupation of the capital and the establishment of the Republic, of which San Martín declined the proffered headship. Defeated at Cancha Rayada, March 19, 1818, he retrieved his fortunes by a decisive victory at the Maipo, April 5, definitely ending the Spanish power in Chile. In August, 1820, he set sail from Valparaiso, with an army of 4500 men, and landing at Pisco, some 150 miles south of Lima, entered the capital in July, 1821, and proclaimed the independence of Peru. In August he was chosen Protector. To Bolívar (q.v.), who in 1822 came to the aid of the Peruvians, San Martín left the task of completing the conquest of the country, resigning his command in August, 1822, and departing for Europe. He lived subsequently at Brussels and in France and died at Boulogne, Aug. 17, 1850. His life was one of devoted patriotism, marred neither by vainglory, factional hatred, nor personal interest. Consult Bartolomé Mitre, *Historia de San Martín y de la emancipación sudamericana* (Buenos Aires, 1890; abridged Eng. trans. by William Pilling, *The Emancipation of South America*, London, 1893).

SAN MATEO, săn mȧ-tā′ō. A city in San Mateo Co., Cal., 18 miles south of San Francisco, on San Francisco Bay and on the Southern Pacific Railroad (Map: California, C 5). It has a public library, three country clubs, fine city hall and school buildings, and many beautiful homes. There are nurseries, a salt factory, oyster beds, and agricultural and horticultural interests. San Mateo has commission government. Pop., 1900, 1832; 1910, 4384.

SANMICHELI, săn′mē-kā′lē, Michele (1484–1559). An Italian architect, born in Verona. He went to Rome, worked under Bramante, and made the acquaintance of Michelangelo, of Sansovino, and of Antonio Sangallo, with whom he was employed in repairing the fortifications of Central Italy. Sanmicheli is reckoned the first to use the bastionary system of fortification. He built imposing city gates in Venice and Verona, the Bevilacqua, Camossa, and Pompeii palaces in Verona (the last named being his masterpiece), the church of the Madonna di Campagna in the same city, and in Venice the Palazzo Grimani and the Palazzo Mocenigo, both famous for their façades.

SAN MIGUEL, mē-gȧl′. A city of the Republic of Salvador, situated 70 miles east of San Salvador at the foot of the volcano of San Miguel or Jucuapa (Map: Central America, D 4). It is the third city of the Republic in size, the capital of a department of the same name, and the centre of a rich agricultural region. It has some foreign trade, especially in indigo. Pop. (est.), 24,768.

SAN MIGUEL DE ALLENDE, dȧ ȧl′yān′dȧ, or **ALLENDE.** A town in the State of Guanajuato, Mexico, 30 miles east of the city of that name (Map: Mexico, H 7). It is the birthplace of Allende, the Mexican patriot, and carries on a trade in horse equipments, blankets, etc. Pop., about 11,000.

SAN MIGUEL DE MAYUMO, dȧ mȧ-yo͞o′mō. A town of Luzon, Philippine Islands, in the Province of Bulacán, situated 22 miles northeast of Malolos. Pop., 1903, 14,919.

SAN MIGUEL DE TUCUMÁN. See Tucumán.

SAN MINIATO, mē′nē-ä′tō. 1. A city in the Province of Florence, Italy, 21 miles by rail west-southwest of Florence. The tenth-century cathedral was remodeled in 1488. The city has a castle built by Barbarossa, a lyceum, and a seminary. There are manufactures of glass, leather, and straw goods and olive oil. Pop. (commune), 1901, 20,042; 1911, 22,253. 2. An ancient church near Florence (q.v.).

SANNAZARO, săn′nȧd-zä′rō, Jacopo (1456–1530). An Italian author, born at Naples. Trained there, he was introduced into the Arcadian Academy, in which he was known as Actius Syncerus. Frederick III, to whom he was devoted, gave him the villa at Mergellina, and when Louis XII's expedition of 1501 obliged Frederick to leave his realm, Sannazaro joined him in exile and served him until his death in 1504. Sannazaro's masterpiece is the *Arcadia*, a pastoral composition in mingled prose and verse, which shows Boccaccio's influence in language and style and helped to form the prose of the period. The work was imitated and translated into foreign languages and influenced the development of the pastoral in European countries. Sannazaro's minor works in Italian comprise some short monologues and a few allegorical farces and his various *Rime*, largely Petrarchian in inspiration. His Latin compositions are among the best of the time. They include elegies, eclogues, and epigrams, besides a longer poem, *De Partu Virginis*. Consult the *Life* in the edition of the *Opere Volgari* (Padua, 1723); the *Opere Latine* (Amsterdam, 1728); Colangelo, *Vita di Jacopo Sannazaro* (Naples, 1819); an edition of the *Arcadia*, and a discussion of its composition by M. Scherillo, in *Arcadia di Jacopo Sannazaro secondo i manoscritti e le prime stampe con note, etc.* (Turin, 1888); E. Carrara, "La poesia pastorale," in *Storia dei generi letterari italiani* (Milan, 1908).

SAN NICOLAS, săn nē′kō-läs′. A town of Luzon, Philippine Islands, in the Province of Pangasinán, situated about 33 miles east of Lingayén. Pop., 1903, 9780.

SAN NICOLÁS, or San Nicolás de los Arroyos. A town in the Province of Buenos Aires, Argentina, on the Paraná River, 40 miles below Rosario (Map: Argentina, G 4). It has a national college and a normal school. It is a growing industrial centre and has steam flour mills and large beef-preserving establishments. It is an important railroad centre and river port. Pop., 1912 (est.), 20,000.

SAN'NIKOFF LAND. The most northwesterly of the islands of the New Siberian Archipelago, in about lat. 76° N., long. 159° E., first seen by Jacob Sannikoff (1805), and again by Baron Toll (1886) from the north point of Kotelnoi Island. Consult Toll, *Die russische Polarfahrt der Sarja* (Berlin, 1909).

SANNYASIN, sȧn-nyä′sĭn (Skt., renouncer). The Sanskrit term for one who has renounced all earthly interests and has devoted himself to a life of asceticism. It referred originally to a Brahman in the fourth and last stage of his life. (See Brahmanism.) The meaning of the word has been extended, however, to include

all religious mendicants, chiefly of the Sivite sects. Consult L. D. Barnett, *Indian Antiquities* (London, 1913). See SAIVAS.

SAN PABLO, pä'blō. A town of Luzon, Philippine Islands, in the Province of La Laguna, situated about 16 miles south of Santa Cruz. Pop., 1903, 22,612.

SAN PEDRO, săn pē'drō. The seaport of Los Angeles (q.v.).

SAN PEDRO, săn pā'drō. A town of Paraguay, 90 miles north of Asunción, on the right bank of the Jujuy (Map: Paraguay, H 2). Stock raising, and the cultivation of tobacco, rice, and sugar cane are the chief occupations. Its principal export is yerba maté. Pop., of municipality (est.), 15,000.

SAN PIER D'ARENA, pē-ār' dȧ-rā'nȧ. A town in the Province of Genoa, Italy, 2½ miles west of Genoa, of which it is a suburb (Map: Italy, B 2). It has a separate city government. It contains the beautiful Palazzo Scassi. The church of Santa Maria della Cella is embellished with frescoes. The city has a technical school. It is a manufacturing centre, with a large sugar refinery, machine shops, and chemical and oil works. Pop. (commune), 1901, 34,885; 1911, 41,802.

SAN'POIL (apparently of North American Indian origin, although sometimes written as Fr. *Sans Poils*, hairless). A small tribe of Salishan stock (q.v.), formerly residing upon the river of the same name and now included with other tribes of the same region upon the Colville Reservation, northeastern Washington. Lewis and Clark in 1804 mention them as *Hihighenimmo*, a corruption of their name among the Yakima. They are confederated with the Nespelim, speaking the same language, the two tribes being the most aboriginal in eastern Washington and until very recently adhering strictly to their primitive conditions and religion. They number 240. See SALISHAN STOCK.

SAN RAFAEL, săn rȧ-fēl'. A city, popular resort, and the county seat of Marin Co., Cal., 15 miles by rail north of San Francisco, on an inlet of San Pablo Bay and on the Northwestern Pacific Railroad (Map: California, C 5). It has a Dominican college, the Hitchcock Military Academy, Mount Tamalpais Military Academy, a Carnegie library, a fine high school, and municipal salt-water baths and pavilion. The city-manager plan of government has been adopted. Pop., 1900, 3879; 1910, 5934.

SAN REMO, rā'mō. A city in the Province of Porto Maurizio, Italy, on the Riviera, 26 miles by rail east-northeast of Nice (Map: Italy, A 3). The particularly mild climate has brought it into prominence as a winter resort. The old town, situated on a hill, is ill built, with narrow crooked streets, but the newer portion, along the coast, has fine promenades, villas, and gardens. The city has a thirteenth-century church, a seminary, and a technical school. There are manufactures of perfumes and mosaics. Pop. (commune), 1901, 21,440; 1911, 23,103 (town, 17,105).

SAN ROQUE, săn rō'kȧ, CAPE. See CAPE SAN ROQUE.

SAN SALVADOR, săl'vȧ-dōr'. The name given by Columbus to the first island which he discovered in America. See GUANAHANI.

SAN SALVADOR. The capital of the Central American Republic of Salvador, situated a little west of the centre of the country, 25 miles from the Pacific coast, and near the foot of the extinct volcano of San Salvador (Map: Central America, C 4). Its houses are all low, surrounded by wide, open areas, and generally inclosing a central patio, being built with a view to withstanding earthquakes, to which the locality is particularly subject. Many of the large buildings are built of wood, including the new cathedral. Noteworthy are the national palace, the Casa Blanca (white house) or presidential mansion, the university, national library, astronomical observatory, and botanical garden. It is a centre of industrial and commercial importance, carrying an active trade in agricultural products, especially indigo and tobacco. Pop. (est.), 60,000. San Salvador was founded in 1525 by Jorge de Alvarado. It has been a number of times nearly or quite destroyed by earthquakes, notably in 1854 and in 1873.

SANS-CULOTTES, săn'-kụ'lŏt' (Fr., without breeches, i.e., wearing trousers instead of the knee breeches then in fashion). The name given in scorn, at the beginning of the French Revolution, by the court party to the democrats of Paris.

SAN SEBASTIÁN, săn sā'bȧs-tē-ăn'. The capital of the Province of Guipúzcoa, Spain, situated on the Bay of Biscay, 12 miles from the French frontier (Map: Spain, D 1). It is built in a very picturesque location on a sandy isthmus connecting the rocky and steep Monte Urgull with the mainland. The town was formerly fortified, and the mountain is still crowned by the fortress of La Mota. On the east the town is bounded by the Río Urumea, and on the west by the Bay of La Concha, which affords a spacious anchorage protected by the island of Santa Clara and is lined with a magnificent beach along its inner shore. The old town lies at the foot of the mountain and has been rebuilt since its destruction during the siege of 1813. A beautiful Alameda running across the isthmus separates it from the new town, which has wide straight streets and handsome parks and promenades. The most notable buildings are the town hall with a handsome façade, the Palacio de la Diputación or provincial government building, the magnificent Gran Casino with its right wing on the beach and its façade towards the Park of Alderdieder, the bull ring capable of seating 10,000 spectators, and the royal palace of Miramar, an unpretentious cottage built near the beach some distance west of the town. San Sebastián is the summer residence of the Spanish royal family, the most fashionable seaside resort in Spain and one of the most beautiful in Europe. Its commerce and industries are considerable, and there are a number of flour and saw mills, iron foundries, and manufactures of paper, beverages, cloth, and hats, while the fisheries are also very important. Pop., 1900, 37,703; 1910, 47,894.

Being a fortified port near the boundary, San Sebastián has often borne the brunt of Franco-Spanish wars. The fort was occupied by the French in 1813 and captured by the English and Portuguese by an assault in which the entire town was destroyed.

SAN SEBASTIÁN DE GOMERA, dȧ gō-mā'rȧ. The chief town of the island of Gomera (q.v.).

SAN SEVERINO MARCHE, sā'vȧ-rē'nō mär'kā. A town in the Province of Macerata, Italy, situated on the Potenza, 32 miles south-southwest of Ancona. It has a cathedral with

a Madonna by Pinturicchio and a library. Machinery, metal and stone ware, glass, and flour are manufactured. There is a trade in wine, oil, fruit, and cattle. Pop. (commune), 1901, 14,385; 1911, 14,764 (town, 3227).

SAN SEVERO, sä-vā'rō. A city in the Province of Foggia, Italy, 19 miles by rail northwest of Foggia. It has a cathedral, a seminary, and a technical school. In 1799 San Severo was destroyed by the French. Pop. (commune), 1901, 30,040; 1911, 31,746 (town, 28,550).

SANSING, sän'sĭng'. The principal town of northeast Manchuria, on the Sungari (Map: China, O 2). Pop., 22,500. A fort and barracks are situated 6 or 7 miles to the east. Sansing is one of the treaty ports. In 1912 imports amounted to 685,072 hk. taels and exports to 1,643,780 hk. taels, a total of 2,328,752 hk. tls. (haikwan tael = $0.74 gold).

SAN'SKRIT LANGUAGE (Skt. *saṁskṛta*, adorned, cultivated, p.p. of *saṁskar*, to adorn, from *sam*, together + *kar*, make). The name ordinarily applied to the whole ancient and sacred language of India. It belongs properly, however, to that dialect which was treated by the Hindu grammarian Panini (q.v.) and his followers. For the last 2000 years or more this language has led a more or less artificial life, being, like Latin during the Middle Ages, the means of communication and literary expression of the priestly, learned, and cultivated castes. (See SANSKRIT LITERATURE.) It is distinguished most obviously from the later derived dialects, Prakrit (q.v.) and Pali (q.v.), whose character and forms in relation to Sanskrit are closely analogous to those of the Romance languages (q.v.) in their relation to Latin. On the other hand, Sanskrit is distinguished, although much less sharply, from the oldest forms of Indian speech, preserved in the religious literature of the *Vedas* (q.v.), *Brahmanas* (q.v.), and *Upanishads* (q.v.). These forms of speech are in their turn by no means free from important dialectic, stylistic, and chronological differences, but they are comprised under the one name, Vedic (or, less properly, Vedic Sanskrit), which is thus distinguished from the language of Panini, whose proper designation is Sanskrit, or classical Sanskrit.

Vedic differs from Sanskrit about as much as the Greek of Homer does from classical Greek. The Vedic apparatus of grammatical forms was much richer and less definitely settled than that of Sanskrit, which gave up much of the earlier language without, as a rule, supplying the proper substitutes for the lost materials. Many case forms and verbal forms of Vedic disappeared in Sanskrit. The subjunctive was lost, and about a dozen Vedic infinitives were reduced to a single one in Sanskrit. Sanskrit also gave up the most important heirloom which had been handed down by the Indian language from prehistoric times, the system of Vedic accentuation. Notwithstanding its very archaic character, Vedic is not to be regarded as a popular tongue, but as the more or less artificial "high speech," handed down through generations by families of priestly singers. Both Vedic and Sanskrit were in a sense caste languages, based upon popular idioms.

As the original home of the Vedic people (see VEDA) was probably in the great Persian region on the northern side of the Himalaya, it has been shown, by comparison of Vedic and Sanskrit with the oldest forms of Persian speech, Avesta (q.v.) and Old Persian (q.v.), that these languages are collectively mere dialects of an older idiom. This is known as the Indo-Iranian (q.v.) or Aryan (in the narrower sense) language (q.v.). The reconstructed Indo-Iranian language differs less from the language of the Veda than classical Sanskrit does from Prakrit and Pali. The language of the Persian Avesta is so much like that of the Veda that entire passages of either literature may be converted into good specimens of the other by merely observing the special laws of sound peculiar to each language. See PHILOLOGY.

Since the revival of classical learning there has been no event of such importance in the history of culture as the discovery of Sanskrit in the latter part of the eighteenth century. The study of this language opened up the primitive Indo-Germanic period and originated the science of comparative philology. Linguistic science, comparative mythology, science of religion, comparative jurisprudence, and other important fields of historical and philosophical study either owe their existence to the discovery of Sanskrit or were profoundly influenced by it. By its aid the monuments of Zoroaster (see AVESTA) were made accessible, as well as the inscriptions of the Persian kings of the Achæmenidan dynasty. See ACHÆMENES.

After Alexander's invasion of India the Greeks became acquainted to a certain extent with the learning of the Hindus. The Arabs in the Middle Ages introduced the knowledge of Indian science to the West, the so-called Arabic (in reality Indian) numerals among other things. Beginning with the sixteenth century, European nations, the Portuguese, Dutch, Danes, English, and French, obtained a more or less permanent foothold in India, but they sought material gain only; nevertheless a few European missionaries acquired some familiarity with Sanskrit, and Abraham Roger even translated the Sanskrit poet Bhartrihari (q.v.) into Dutch as early as 1651. But the first Sanskrit grammar to be published in Europe, that of Father Paulinus a Santo Bartholomeo, was printed in Rome no earlier than 1790. English scholars in India, Sir William Jones (q.v.), Charles Wilkins, H. T. Colebrooke (q.v.), H. H. Wilson (q.v.), and others, at the end of the eighteenth century, were the first real mediators between India and Europe. Wilkins's translation of the *Bhagavad-Gita* (q.v.) and Jones's translation of the *Sakuntala* (q.v.) elicited the greatest admiration. Especially in Germany, men like Herder (q.v.), Goethe (q.v.), the brothers Schlegel (q.v.), and Wilhelm von Humboldt (q.v.) were attracted to the new language, its literature, and its theosophy. Since Bopp (q.v.; see also PHILOLOGY), who laid the foundation of the science of comparative grammar, both Indology and comparative philology have occupied a prominent place in all centres of learning.

The Sanskrit language has on the whole preserved the linguistic conditions of the Indo-Germanic parent speech better than any other member of the Indo-Germanic family of languages. In its vocalism it has merged the two triads of vowels, *a*, *e*, *o* and *ā*, *ē*, *ō* respectively, into *a* and *ā;* thus, Indo-Ger. **andhos*, flower (Gk. *ἄνθος*), and **menos*, mind (Gk. *μένος*), are Skt. *ándhas* and *mánas;* Indo-Ger. **pōd*, foot, and **di-dhē-mi*, set (Gk. *τίθημι*), are Skt. *pād-* and *dádhāmi*. With this single exception Sanskrit reflects the prehistoric system of vocalism most

perfectly. The preservation of the Indo-Germanic lingual vowels, *r* and *l*, as Skt. *ṛ*, as Indo-Ger. *e-dṛk-om*, I have seen, Skt. *á-dṛs-am*, or **ulqos*, wolf, Skt. *vṛka-s*, led to the recognition of the fact that lingual and nasal vowels belonged to the original stock of the whole family of languages and was followed by far-reaching and permanent results concerning the entire system of vocalism. The Indo-Germanic indeterminate vowel, or sh'wa (*ə*), appears in Sanskrit as *i*, and its wide preservation in Sanskrit led to the important theory of dissyllabic roots or stems. The preservation in many texts of the Veda of the old system of accentuation made it possible for Verner to discover his famous law (see VERNER'S LAW) which explained the apparent exceptions to Grimm's law (q.v.).

In its consonant system Sanskrit has preserved the original five series of mutes—labials, dentals, palatals, gutturals, and labiovelars (see PHILOLOGY)—and has in addition developed an important sixth series, the linguals or cerebrals, mutes produced by the influence of the *r* and *l* sounds. Thus, Indo-Ger. **dendrom*, tree, staff (Gk. *δένδρον*), becomes Skt. *daṇḍá*, staff; or the Vedic root *nart*, dance, becomes *naṭ* in Sanskrit. Most important is the undisturbed preservation in Sanskrit of the Indo-Germanic consonant aspirates, *bh*, *dh*, *gh*, which underwent radical changes in all other Indo-Germanic languages, as Indo-Ger. **bherō*, I carry, Skt. *bhárāmi*, but Gk. *φέρω*, Lat. *ferō*, Goth. *baíra*, etc. The Indo-Germanic surd aspirates are also preserved most clearly in Sanskrit, as *th* in Skt. *vetthá*, thou knowest, Gk. *Foῖσ-θα*, Goth. *wais-t;* or *kh* in Skt. *śaṅkha*, conch shell, Gk. *κόγχος*.

Sanskrit has preserved all the Indo-Germanic cases, having independent forms for the instrumental and locative in addition to the more familiar cases of the remaining languages. In verb formation it has retained and developed the distinction between the so-called thematic (*ō* verbs) and nonthematic (*mi* verbs), which has practically passed out of the remaining languages of the family with the exception of the Greek. Sanskrit abounds in varieties of present systems and aorist systems, offering in the last-mentioned respect strikingly close parallels to Greek. The modal forms, such as the subjunctive, the injunctive, and the optative, are present, but have never developed into the delicate syntactical categories of either Greek or Latin. On the other hand, the so-called secondary systems of conjugation, intensive, desiderative, and causative, have become indefinitely productive, so that theoretically every verb is entitled to any of these formations, as Skt. *sídati*, he sits, and *sādáyati*, he sets; *náśyati*, he perishes, and *nāśáyati*, he destroys.

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SANSKRIT LITERATURE. The literature in Sanskrit (see SANSKRIT LANGUAGE), like the language, may be divided into two periods, the Vedic and the Sanskrit. Notwithstanding the continuity of the Hindu writings, the spirit of Sanskrit literature differs greatly from the Vedic. The chief distinction between the two periods is that the Veda (q.v.) is essentially a religious collection, whereas Sanskrit literature is, with rare exceptions, profane. In the Veda the lyric and legendary forms are in the service of prayer, or exposition of the ritual; in Sanskrit epic, didactic, lyric, and dramatic forms have been developed far beyond their earlier forms for the purpose of literary delectation and æsthetic or moral instruction. In Sanskrit literature, moreover, with the exception of the *Mahabharata* (q.v.) and the *Puranas* (q.v.), the authors are generally definite persons, more or less well known, whereas the Vedic writings either go back to families of poets or schools of religious learning.

The form and style of Sanskrit literature differs ordinarily from that of the *Vedas* (q.v.). Vedic prose was developed in the *Yajur-Vedas*, *Brahmanas* (q.v.), and *Upanishads* (q.v.) to a tolerably high pitch; in Sanskrit, aside from the strained scientific language (*sutra;* q.v.) of philosophy and grammar, prose is found in genuine literature only in fables, fairy tales, romances, and partially in the drama. Nor has this prose improved in literary and stylistic

quality, as compared with the earlier variety. On the contrary it has become more and more clumsy, full of long awkward compounds and other artificialities. As regards the poetic medium of classical Sanskrit, it also differs from the Veda. The bulk of Sanskrit poetry, especially the epic, is composed in the *sloka* metre, a development of the Vedic *anustubh* stanza of four octosyllabic lines of essentially iambic cadence. But numerous other metres, usually built up on Vedic prototypes, have become more and more elaborate than their old originals, and in the main they have also become more artistic and beautiful.

Sanskrit literature may be divided into epic, lyric, didactic, dramatic, and narrative. **Epic Poetry** falls into two classes, the freer narrative epic, termed *ititasa* (legend) or *purana* (ancient tale), and the artistic or artificial epic, called *kavya* (poetic product). The great epic of the *Mahabharata* (q.v.) is by far the most important representative of the former kind. Of somewhat similar free style are the 18 *Puranas* (q.v.) of much later date. The beginnings of the artistic style are seen in the other great Hindu epic, the *Ramayana* (q.v.). But the finished epic kavya is not evolved until the time of Kalidasa (q.v.), about the sixth century A.D. This universal poet and dramatist is the author of the two best-known artistic epics, the *Kumarasambhava* (q.v.) and the *Raghuvamsa* (q.v.).

The *Kumarasambhava* consists of 17 cantos, the first seven of which are devoted to the courtship and wedding of the deities Siva (q.v.) and Parvati, the parents of the youthful god of war. Usually only these seven are printed, owing to the erotic character of the remaining cantos. The real theme of the poem appears only towards the end, in the account of the destruction of the demon Taraka, the object for which the god of war was born. The artistic, or rather the artificial, character of the kavyas removes them far from the sphere of the genuine epic; their importance lies especially in their wealth of descriptive power and delicacy of illustration, and not so much in their portrayal of characters or stirring action. The first 15 cantos of the *Raghuvamsa* deal with Rama and his dynasty (see RAMAYANA), while the remaining four cantos give an account of the 24 kings who ruled as Rama's descendants in Ayodhya. The remaining kavyas deal for the most part with themes from the *Mahabharata* and *Ramayana*. The epic is commingled more and more with lyric, didactic, and erotic elements, as well as with bombast and verbal jugglery (puns) of every kind. The Hindus consider six kavyas entitled to the name "great epic" (*mahakavya*) in addition to the two of Kalidasa just mentioned, the *Kiratarjuniya* of Bharavi (q.v.), describing a combat between Siva (q.v.) and Arjuna (q.v.); the *Sisupala-vadha* (see SISUPALA) of Magha; the *Naisadhiya*, ascribed to Harsha (q.v.), a version of the story of Nala (q.v.), a well-known episode of the *Mahabharata;* and finally the *Bhattikavya*, ascribed to Bhatti (q.v.) or Bhartrihari (q.v.).

Every form of artistic Sanskrit literature, whether epic, dramatic, or confessedly lyric, has a strong lyric cast. At the bottom these three kinds, in the Hindu poet's hands, are but thematically differentiated forms of the same poetic endowment. Ornate figures of speech, singly or in masses, luxuriant richness of coloring, carried into literary composition from the gorgeousness of the climate, flora, and fauna of India, subtle miniature painting of every sensation and emotion—these are the common characteristics of Hindu artistic poetry.

Lyric Poetry can hardly do more than emphasize or specialize these conditions, yet it has its individual traits, the most important of which is the refined elaboration of the single strophe in distinction from continuous composition. The forms of these strophes are very elaborate and almost infinitely varied. The most elaborated of the longer lyric compositions are the *Meghaduta* and the *Ritusamhara*, both by Kalidasa (q.v.). The theme of the former is a message sent by an exiled Yaksha (elfin) to his love by a cloud. The first part of the poem describes the scenes through which the cloud will pass in its course; in the second part the Yaksha pictures his far-off home and the charms of his beloved, whom he imagines tossing on her couch through the watches of the night. When the cloud beholds her, let it tell of his own longings, how in creepers he beholds her form, in the eyes of startled hinds her glances, in the moon her lovely face, and in peacocks' plumes her shining tresses. The *Ritusamhara* is famous for its descriptions of India's tropical nature, interspersed with expressions of human emotion. Spring, that causes the downpour of the pollen of the mango blossoms, that intoxicates the world with his fragrance, and swarms with honey-drunk bees, arouses sweet longings in every breast. In the rainy season when the lover, confined at home by the downpour of the waters, shivers with cold, his long-eyed love presses him to her heart and turns the dreary day to sunshine. The poet's keen powers of observation are equaled by his subtle appreciation of every human mood.

The bulk of lyrical poetry, however, is in single miniature stanzas which suggest strongly the didactic proverb poetry which the Hindus also cultivated with great success. In fact the most famous collection of such stanzas, that of Bhartrihari (q.v.), perhaps the greatest poet of India next to Kalidasa, consists of both lyric, didactic, and philosophic poems. Ever and again, within the narrow frame of a single stanza, this poet pictures the world of him for whom the wide universe is woman, from whose eyes there is no escape.

The second great master of the erotic stanza is Amaru, who is probably of a later date than Bhartrihari. His collection is known as *Amarusataka*. He also is a master in the art of painting all the moods of love, bliss and dejection, anger and devotion. Never does the Indian lyrist treat love from the romantic or ideal point of view; it is always sensuous, though rarely coarse or commonplace.

Even in lyrics the Hindu's tendency towards speculation and reflection is evident. Not only has it been the basis of much that is best in the religion and philosophy of India, but it has also assumed shape in another important product of Hindu literature, the **Gnomic, Didactic, Sententious Stanza**, which may be called the **Proverb**. Böhtlingk (q.v.) has collected from all parts of Sanskrit literature some 8000 of these stanzas; they begin with the *Mahabharata* and are found in almost every moral appended to the fable literature. Their keynote is again the vanity of human life and the superlative happiness that awaits resignation. The mental

calm of the pious anchorite, who lives free from all desires in the solitude of the forest, is the only remedy for human unrest. But for him who remains in the world there is also a kind of salvation, viz., virtue. These gnomic stanzas were frequently composed or gathered into collections. Bhartrihari's two centuries on wisdom and renunciation are compositions of this sort. A Kashmirian poet named Silhana is the author of the *Santi-sataka*, and another collection is designated *Moha-mudgara*. There are many other collections, but naturally the ethical saw is most at home in the fables of the *Pancatantra* (q.v.) and *Hitopadesa* (q.v.). These works go back to Buddhist models, which recall the fact that the *Dhammapada* (q.v.), a Buddhist collection of aphorisms, contains perhaps the most profound words of wisdom in Hindu literature. It may be said that there is scarcely a conceit or adage of the proverb literature of other peoples that cannot be paralleled in Hindu stanzas.

The Sanskrit **Drama** is one of the latest, though one of the most interesting, products of Sanskrit literature. With all the uncertainty of literary dates in India there is no reason for assuming for this class of works a date earlier than the fifth or sixth century of our era. Certain Vedic hymns in dialogue are all that the earliest time suggests as a possible, but very doubtful, basis of the drama. The Sanskrit name for drama is *nātaka*, from the root *nat*, *nart*, to dance. The word therefore means literally ballet; it is not doubtful that dances contributed to the development of the drama. In various religious ceremonies of earlier times dancing played a part; at a later time the cult of Siva (q.v.) and Vishnu (q.v.), and especially of Vishnu's incarnation, the god Krishna (q.v.), was accompanied by pantomimic dances. These pantomimes reproduced the heroic deeds of these gods and were accompanied by songs. Popular representations of this sort, the so-called *Yatras*, have survived to the present day in Bengal. They are not dissimilar to the mystery plays of the Christian Middle Ages and their modern continuation, the passion plays. The god Krishna and Radha, his love, are the main characters, but there are also friends and enemies of Radha. The *Yatras*, a mixture of music, dancing, song, and improvised dialogue, while undoubtedly connected with the origin of the drama, are nevertheless separated by a very wide gap from the finished product of the *nataka*, as it appears in such dramas as the *Sakuntala* (q.v.) of Kalidasa or the *Mricchakatika* (q.v.) of Sudraka (q.v.).

It is still a moot question whether Western (Greek) influence, particularly the New Attic comedy of Menander (q.v.), has not in some measure contributed to the shaping of the Hindu drama. (See DRAMA, *Greek Drama* and *Indian Drama*.) It is known that Greek actors followed Alexander the Great through Asia and that after his death Greek kings continued to rule in northwestern India. Brisk commerce was carried on between the west coast of India and Alexandria, the later centre of Greek literary and artistic life. Greek art and Greek astronomy undoubtedly exercised strong influence upon Hindu art and science, but it is very doubtful whether Greek plays were ever performed in India. Notwithstanding the efforts of Professors Weber and Windisch, only one fact seems to support the theory of Greek influence on Hindu drama, and that is that the curtain was called *yavanika*, or Greek partition (Ἰωνική). Furthermore, the improbability of such a theory is emphasized by the striking affinities between the Indian drama and that of the Elizabethan period, especially Shakespeare. Thus both mix the comic with the serious, and prose with verse; both aim to portray individual persons and not types of character, both fail to observe the rule of unity of time and place, and have other things in common. The court jester (*vidushaka*), e.g., closely resembles the fool in Shakespeare. But in spite of these points of resemblance, we know that it was utterly impossible for these two dramas to have influenced each other. Whatever the external relationships of Hindu drama, its inner matter is certainly altogether national and Indic. The themes are for the most part those of the heroic legend in the epics or they move in the sphere of the actually existing Hindu courts. On the whole they are not different from those that figure in the tales and romances which are worked up in narrative form.

The chief dramatic writer of India is Kalidasa (q.v.; see also SAKUNTALA), master at the same time also of epic and lyric poetry. From a time somewhat earlier than that of Kalidasa comes the drama *Mricchakatika* (q.v.), said to have been written by King Sudraka (q.v.), but more probably composed by Dandin (q.v.) or some poet at Sudraka's court. Similarly during the seventh century a king named Harsha (q.v.) is said to have written three well-known dramas. From the eighth century date the dramas of Bhavabhuti (q.v.), who is, next to Kalidasa and Sudraka (Dandin), the most distinguished of the Hindu dramatists. Finally may be mentioned Visakhadatta (q.v.), whose composition also dates from the eighth century.

It is not possible here to characterize the great variety of all these themes, the different talents of their authors, and the literary quality of these compositions. "Action is the body of the drama"; such is the dictum of the Hindu theorists. Precisely what we should call dramatic action is not, however, the prominent quality of the compositions even of Kalidasa. His dramas are distinguished rather by tenderness of feeling and delicacy of touch. They are lyric rather than dramatic. The action is slow, the passions are profound rather than elemental. At the height of their sentiments, in profound misery, the hero and the heroine still find time to institute comparisons between their own feelings and the phenomena of nature. There is, indeed, a plethora in them all of mango trees and *patala* blossoms, of creepers and lotus, of bimba lips, of gazelles, flamingoes, and multicolored parrots. Yet they are always artistic and finished, especially when the climate and life of India is borne in mind, and their beauty suggests strongly the genius of Goethe.

No department of Indian literature is more interesting to the student of comparative literature than that of the **Fables and Fairy Tales**. There is scarcely a single motive of the European fable collections that does not appear in some Hindu collection, and there is, indeed, good reason for believing that the bulk of this kind of literature originated in India. The earliest and most important collection of Hindu fables is Buddhistic and is written in Pali; it

seems to reach back to the fourth century B.C. This collection is known as the *Jatakas* (q.v.), which are without doubt very old. The two most important Sanskrit collections, the *Pancatantra* (q.v.) and the *Hitopadesa* (q.v.), are based upon Buddhist sources. A noteworthy feature of the Sanskrit collections of fables and fairy tales is the insertion of a number of different stories within the frame of a single narrative, a style of narration which was borrowed by other Oriental peoples, the most familiar instance being the *Arabian Nights*. The *Pancatantra* passed from the Pahlavi into Arabic, Greek, Persian, Turkish, Syriac, Hebrew, Latin, and German, and from German into other European languages. The name *Pancatantra* is probably not original, having perhaps displaced Karataka and Damanaka, or some similar title derived from the names of two jackals in the first book. This may be surmised because the title of the Syriac version is *Kalilag wa Damnag*, of the Arabic version *Kalilah wa Dimnah*. Both the *Pancatantra* and the *Hitopadesa* were originally intended as manuals for the instruction of princes in domestic and foreign policy. The *Hitopadesa*, said to have been composed by Narayana, professes to be an excerpt from the *Pancatantra* and other books.

The most famous collection of fairy tales is the very extensive *Kathasaritsagara*, composed by the Kashmirian poet Somadeva (q.v.) about 1070 A.D. Three much shorter collections are in prose. The *Sukasaptati* (q.v.) is one of the best. The *Vetala-pancavimsati* is known to English readers under the title of *Vikram and the Vampire*. The third collection is the *Simhasana-dvatrimsika*, in which the throne of King Vikrama (q.v.) tells the stories. All these collections have an outer frame story, within which a certain part of the common Hindu stock of tales is inserted. A few **Prose Romances** of more independent character, dating from the sixth and seventh centuries, may be mentioned in this connection. The Hindu theorists class them as poems (*kavya*), but they are much more like our own earlier novels. The *Dasakumara-carita*, by Dandin (q.v.), is a story of corrupt society and reminds one of the *Simplicissimus* of Grimmelshausen (q.v.). The *Vasavadatta*, by Subandhu (q.v.), of somewhat later date, formed the stylistic basis of the *Kadambari*, by Bana (q.v.); the latter narrates, in stilted language and long compounds, the romantic love story of an ineffably noble prince and the equally ineffably beautiful and virtuous fairy princess Kadambari. Other works of this class, known as *carita*, continued to be composed at a later time. The same term, *carita*, is also used for **Chronicles**, or quasi-historical literature. Historical works in the European sense do not exist in India. The nearest approach to history in our sense of the word is the *Rajatarangani* (q.v.), by Kalhana. A modern work of a similar kind, but of much smaller extent, is the *Ksitisavamsavalicarita*, the chronicle of a series of royal families who reigned in Bengal. It was composed in the middle of the eighteenth century.

India abounds in all forms of **Scientific Literature**, written in tolerably good Sanskrit even to the present day. The ancient legal books of the Veda continue in modern poetical *Dharmasastras* and *Smrtis*, of which the *Law-Books of Manu* (see MANU) and *Yajnavalkya* (q.v.) are the most famous examples. Rooted in the *Upanishads* (q.v.) are the six Hindu systems of philosophy and their abundant writings. (See MIMAMSA; NYAYA; SANKHYA; VAISESHIKA; VEDANTA; YOGA.) Grammar, etymology, lexicography, prosody, rhetoric, music, and architecture each own a technical literature of wide scope and importance. The earliest works of an etymological character are the Vedic glosses of Yaska (see NIRUKTA); later, but far more important, is the grammar of Panini (q.v.) and his commentators Katyayana (q.v.) and Patanjali (q.v.). Mathematics and astronomy were eagerly cultivated from very early times, the so-called Arabic numerals coming to the Arabs from India, and designated by them as Hindu numerals. Indian medical science must have begun to develop before the beginning of our era, for one of its chief authorities, Caraka, was the chief physician of King Kanishka in the first century A.D. The germs of Hindu medical science reach back to the *Atharva-Veda*. (See VEDA.) The Bower manuscript, one of the oldest of Sanskrit manuscripts (probably fifth century A.D.), contains medical statements which agree verbally with passages in the works of Susruta and Caraka, the leading authorities on this subject.

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SANSOVINO, sän'sō-vē'nō, ANDREA, properly ANDREA CONTUCCI (1460–1529). One of the principal Florentine sculptors of the high Renaissance. He was born at Monte San Savino, near Arezzo, and studied at Florence with Antonio Pollaiuolo and Bertoldo. The most important of his early works are reliefs of the "Annunciation," a "Pietà," and the "Coronation of the Virgin," in Santo Spirito, Florence. About 1490 he was appointed sculptor and architect to John II, King of Portugal, for whom and his successor, Emanuel I, he built a royal palace and executed sculptures, of which a bronze bas-relief of John and a statue of St. Mark still exist at Coimbra. After nine years' absence he returned to Florence and occupied himself with a font for the baptistery at Volterra (1502); a "Madonna and Child" and a "St. John Baptist" for the cathedral at Genoa (1504); and a group, the "Baptism of Christ," above the doors of the baptistery at Florence. Though completed a century later by Vincenzo Danti, the figures are as beautiful in conception and execution as their disposition is monumental. After 1505 he went to Rome and executed for Pope Julius II his two chief works, the monuments of the two cardinals Sforza and Basso in Santa Maria del Popolo. He made for a chapel of the church of San Agostino a "Madonna with Child and St. Anne" and went to Loreto in 1513 to superintend the decoration of the Casa Santa, most of which was executed by his pupils and is mannered in style. His statues are executed with admirable technique and are mild and beautiful in conception, but they possess the generality of type derived from the antique common to the high Renaissance, with a consequent loss of characteristic and individual qualities. Consult Rosenberg, in Robert Dohme, *Kunst und Künstler Italiens* (Leipzig, 1879), and Schönfeld, *Andrea Sansovino und seine Schule* (Stuttgart, 1881).

SANSOVINO, JACOPO (TATTI) (1486–1570). A Florentine sculptor and architect of the high Renaissance. He was born in Florence, the son of Antonio Tatti; but he adopted the surname of his first master. (See SANSOVINO, ANDREA.) After working in Florence he went to Rome, where he gained the friendship and patronage of Bramante, and Pope Julius II employed him to restore antique statues. Returning to Florence, he modeled the fine "St. John" in the Duomo, the beautiful nude "Bacchus" now in the Bargello, and many other figures. In 1514 he returned to Rome and fashioned the colossal "Madonna" for the church of Sant' Agostino, now reputed to perform miracles and loaded with votive offerings. He furnished the design for the church of San Giovanni dei Fiorentini, completed by Antonio di Sangallo. When Rome was sacked in 1527, Sansovino removed permanently to Venice, where he founded an influential school and for many years held the foremost position among architects. After completing the restoration of St. Mark's he erected the Cornaro Palace (1532) and in 1536 commenced the Library of St. Mark, considered the most beautiful secular edifice in Italy. He also built the Zecca (Mint); the graceful loggia of the campanile (destroyed by the fall of the campanile and recently reconstructed); the church of San Giorgio dei Grechi (1550); the façade of the Scuola di San Giorgio Schiavone (1551); the Fabbriche Nuove (1555), and many other fine edifices. The chief works in sculpture of his Venetian period are the monument to Doge Venier in San Salvatore; the statues of "Peace," "Apollo," "Mercury," and "Minerva," in the loggia of the campanile; the bronze doors of the sacristy in St. Mark's; the colossal statues of "Mars" and "Neptune" on the staircase of the Doge's Palace; and the statue of Thomas of Ravenna over the portal of San Giuliano. In the Altman collection, Metropolitan Museum, New York, is a group, "Charity." Sansovino, by the favorable circumstances of his training, was able to combine the science and grace of Florentine art and something of the severity of the Roman with the decorative luxuriance of the Venetian, but his work is unequal, and while he rarely fails to charm he lacks profound comprehension, and typifies the decline of the true Renaissance. Consult: Tommaso Temanza, *Vita di Jacopo Sansovino* (Venice, 1752); Giorgio Vasari, *Lives of the Most Eminent Painters, Sculptors, and Architects*, vol. iv (Eng. trans. by Blashfield and Hopkins, New York, 1896); Laura Pittoni, *Jacopo Sansovino, scultore* (Venice, 1909).

SANS-SOUCI, sän'-sōō'sē' (Fr., free from care). A royal palace at Potsdam, Prussia, erected by Frederick the Great in 1745–47, where he spent his last years. The unpretentious one-storied buildings, situated in a splendid park and adorned with a fine colonnade, contain many personal relics of the King.

SAN STEFANO, sän stā'fä-nō, TREATY OF. See BERLIN, CONGRESS OF; RUSSO-TURKISH WAR.

SANTA ANA, sän'tä ä'nä. A city of the Republic of Salvador, situated 28 miles northwest of San Salvador (Map: Central America, C 4). It is the capital of the Department of Santa Ana, is regularly laid out with straight and well-paved streets, and has several fine public buildings. The country is very fertile, and the city is the centre of the sugar trade. It is connected by railroad both with the capital and the port of Acajutla. Pop. (est.), 48,000.

SANTA ANA. A city and the county seat of Orange Co., Cal., 33 miles by rail south by east of Los Angeles, on the Southern Pacific and Atchison, Topeka, and Santa Fe railroads, and the Pacific Electric Railway, reaching Los An-

geles (Map: California, H 9). It has a Carnegie library and the Orange County Teachers' Library, and a fine polytechnic high school. Santa Ana is important commercially, and has two large beet-sugar factories. Pop., 1900, 4933; 1910, 8429; 1915, 13,273; 1920, 15,485.

SANTA ANA. See KERESAN STOCK.

SANTA ANA DE CORO. See CORO.

SANTA ANNA, or **ANA,** ANTONIO LÓPEZ DE (?1795–1876). A Mexican general and politician, born at Jalapa. Entering the army at the age of 15, he first attracted attention in 1821 as an adherent of Itúrbide (q.v.) in the events leading up to the overthrow of the Spanish power. In 1822 he became commandant of Vera Cruz, but, on being accused of harboring designs inimical to the government, turned against Itúrbide in December of the same year and headed a rebellion which took shape as the Plan of Casa Mata and gained support so rapidly that Itúrbide hastened to anticipate overthrow by resigning. In 1828 Santa Anna took the field as a partisan of Guerrero, whom he aided in his successful attempt to supplant Pedraza as President. He became, in the following year, Minister of War and commander in chief, and in August and September achieved distinction by expelling from the country a Spanish army of invasion, thus ending the last attempt on the part of Spain to reëstablish its authority in Mexico. Personal ambition led him to rise in insurrection against both Guerrero and Guerrero's successor, Bustamente, after whose enforced resignation in 1832, Pedraza, now an ally of Santa Anna, held the chief power for some time. In February, 1833, Santa Anna was chosen President as the chief of the Federalist party, whose aim was to establish a centralized government in Mexico. Gómez Farías was chosen Vice President, and to him Santa Anna left the cares of office and the odium of a generally unpopular policy, while he himself retired to his hacienda, whence, however, he kept a close watch on the progress of events. From federalism Santa Anna moved backward towards reaction and monarchism and entered into close relations with the Clericals. This led to republican insurrections, the most formidable of which was suppressed with severity by Santa Anna in 1835. The Texas colonists having undertaken to organize a government of their own, Santa Anna set out to reduce them to obedience. In February, 1836, he attacked San Antonio, and on March 6 captured the Alamo (q.v.). On April 21, however, General Houston, who was being pursued by Santa Anna, suddenly turned and defeated the Mexican army at San Jacinto (q.v.). Santa Anna was captured, and after promising to exert his influence for obtaining the independence of Texas was allowed to go to the United States, whence he returned in 1837 to Mexico. In November, 1838, he defended Vera Cruz against a French fleet, and, from the loss of a leg in the combat, derived for a time enormous popularity. In the disordered condition of the country many turned to him for a strong leader, and in October, 1841, he became President with dictatorial powers. He ruled entirely in the interests of the Federalist party till June, 1844, when he was elected Constitutional President. Disaffection was rife, however, and in November an insurrection headed by Paredes led to his overthrow. He was taken prisoner early in 1845 and banished. The threatened war with the United States probably hastened his recall in July, 1846; in December he was made Provisional President, and soon after he took the field against the American forces. On Feb. 22–23, 1847, he was defeated by General Taylor at Buena Vista (q.v.). This was followed by his defeat at the hands of General Scott at Cerro Gordo (q.v.) on April 18. After the occupation of the city of Mexico by the American army Santa Anna resigned the presidency, made an attempt to recapture Pueblo, and, failing, sailed for Jamaica, whence he went to Venezuela. In 1853 he was recalled and elected President for one year. After a series of intolerable and despotic acts he issued a decree (December, 1853), declaring himself President for life, with the title of Serene Highness. The inevitable rebellion broke out in March, 1854, and after 15 months' campaigning in the Western States, Santa Anna realized the hopelessness of his position and in August, 1855, sailed from Vera Cruz for Cuba. He lived for some time in Venezuela and St. Thomas, and in 1864, during the French invasion, returned to Mexico, where he attempted to play a part in affairs, but was compelled by Bazaine to leave the country. Still striving for political power, he reappeared at Vera Cruz in 1867, but was made prisoner and once more sent into exile. He lived subsequently in the United States, returned to Mexico after the death of Juárez, and died in the city of Mexico, June 20, 1876, poor and neglected. An able soldier and a master of intrigue, with a remarkable capacity for anticipating and manipulating public opinion, Santa Anna enjoyed a longer period of public life than any of his contemporaries in the political vicissitudes of nineteenth-century Mexico. None of the general histories of Mexico contain an adequate treatment of this perplexing personality; R. A. Wilson, *Mexico* (New York, 1856), gives a useful contemporary account of the man at the height of his career. Consult also H. H. Bancroft, *History of the Pacific States of North America*, vols. viii, ix (San Francisco, 1882–90).

SANTA ANNA, MARQUÉS DE. See CERVERA Y TOPETE, MARQUÉS DE SANTA ANNA.

SANTA BÁRBARA, bär'bä-rä. The capital of the Department of the same name, Honduras, 110 miles northwest of the capital, Tegucigalpa (Map: Central America, C 3). In the vicinity are mines of gold, silver, nickel, and zinc. The country produces extensively grain, sugar cane, coffee, cacao, and rice. The town has saw mills and manufactories of hats and spirits. It is a place of deposit for Puerto Cortés. Pop. (est.), 6000.

SANTA BÁRBARA. A town of Panay, Philippine Islands, in the Province of Iloilo, situated 11 miles north of Iloilo. Pop., 1903, 15,149.

SANTA BARBARA. A city and the county seat of Santa Barbara Co., Cal., 104 miles by rail west by north of Los Angeles, on Santa Barbara Channel and on the Coast Line of the Southern Pacific Railroad (Map: California, F 8). Santa Barbara is picturesquely situated on a slope rising gradually from the shore to the old Franciscan Mission, 340 feet above the bay. This mission, the most important and best preserved of the California missions and the only one in which ministrations have never ceased since its founding, was established in 1786. The city has a mild, equable climate, owing to peculiar topographical conditions. It

contains a State normal school of manual arts, the famous Los Baños del Mar, St. Anthony's College, and a large public library. Other noteworthy features are the city hall, Federal building, courthouse, country club, recreation centre, Y. M. C. A., four public parks, and the Potter and Arlington hotels. There are extensive lemon-packing establishments in the city. Santa Barbara was founded as a Spanish presidio in 1782. Pop., 1900, 6587; 1910, 11,659; 1915 (U. S. est.), 14,332; 1920, 19,441.

SANTA BÁRBARA DE OCAMPO, dȧ ō-käm'pō (or simply OCAMPO). A Mexican town of the State of Tamaulipas, 57 miles south of Ciudad Victoria (Map: Mexico, J 6). Its parish church is the second in importance in the state. The town was founded in 1749 by the Franciscans. Pop., 1910, 2804.

SANTA BÁRBARA DE SAMANÁ, sä'-mȧ-nä'. A seaport of Santo Domingo. See SAMANÁ.

SANTA CASA, kä'sȧ (It., holy house). A celebrated shrine in Loreto, Italy, said to be the house in which the Virgin Mary lived at Nazareth, miraculously transported to its present site in 1295.

SANTA CATALINA DEL SALTADERO, sän'tȧ kä'tȧ-lē'nȧ dĕl säl'tȧ-dā'rō. See GUANTANAMO.

SANTA CATHARINA, kä'tȧ-rē'nȧ. A state of Brazil (Map: America, South, D 5). Area, 28,624 square miles. The coast is low, but a short distance inland extends the Serra Geral, which exceeds in its highest summits 6000 feet. The climate is hot on the coast and temperate in the elevated interior. Santa Catharina is naturally well adapted for agriculture and stock raising, but, though the latter is well advanced, the scarcity of population greatly hinders its development. The chief agricultural products are coffee, sugar cane, cotton, tobacco, maté, manioc, and corn. Coal deposits have been discovered in the Serra Geral, and the coal mines have been connected by a railroad with the coast. Pop., 1900, 320,289; 1910 (est.), 410,000. There is a large European, chiefly German, population. The capital is Florianopolis (q.v.).

SANTA CATHARINA. The capital of the State of Santa Catharina, Brazil. See FLORIANOPOLIS.

SANTA CATHARINA, GELASIUS A. See DOBNER, J. F.

SANTA CLARA, klä'rȧ. A province of Cuba, occupying the central portion of the island (Map: Cuba, E 4). Area, 8641 square miles. The interior is an undulating plateau with a number of detached hills or mountain groups rising in the southeast to a height of about 3000 feet. The southwest portion consists of the vast swamps known as the Cienaga de Zapata. The north coast is lined with numerous islets. The chief river is the Sagua, the largest on the whole north coast of the island and navigable 20 miles. The province contains some of the largest sugar plantations and factories, while tobacco is also largely raised, and the upland savannas offer rich pasturage. It is also rich in minerals, and asphalt, silver, and copper are mined. Pop., 1907, 457,431. The capital is Santa Clara (q.v.).

SANTA CLARA, or VILLA CLARA. The capital of the Province of Santa Clara, Cuba, situated nearly in its centre on the Cuban main trunk railroad and in a somewhat elevated savanna region (Map: Cuba, E 4). It is a pleasant, well-built town, with wide streets. Good tobacco is grown in the district, and there is an asphalt mine producing 10,000 tons annually, while petroleum deposits and graphite, gold, and copper are also found in the neighborhood. Besides the main trunk line to Havana there are railroads running to the ports of Cienfuegos on the south and Sagua la Grande on the north. Pop., 1907, 16,702. Santa Clara was founded in 1690. During the revolution (1895 to 1898) it was an important fortified post of the Spaniards and the centre of active operations.

SANTA CLARA, sän'tȧ klâr'ȧ. A town in Santa Clara Co., Cal., 47 miles southeast of San Francisco, on the Southern Pacific Railroad (Map: California, C 5). It is the seat of Santa Clara University (see SANTA CLARA, UNIVERSITY OF) and of the Notre Dame Academy, and contains the old Santa Clara Mission. Alameda Avenue, traversing a beautiful country, extends to San Jose, 3 miles distant. Millwork, sashes and doors, windmills, coffins, and leather are manufactured. Green and cured fruits are prepared and shipped in large quantities. Santa Clara was settled in 1780 and incorporated in 1852. Pop., 1900, 3650; 1910, 4348.

SANTA CLARA. See TANOAN STOCK.

SANTA CLARA, UNIVERSITY OF. A Roman Catholic institution for higher education, founded in 1851 on the site of the old mission of Santa Clara at Santa Clara, Cal. In 1875 the institution was chartered as a university and continued for many years to be known as Santa Clara College. The departments of law, medicine, and engineering were established in 1907, and in 1912 the present name was adopted. The university includes the college of philosophy and letters, the college of general science, the institute of law, the college of engineering (including architecture, civil, electrical, and mechanical engineering), the school of pedagogy, and the premedical course. In the theatre on the campus many dramatic productions, including the Passion Play, and the Mission Play of the Santa Clara, have been presented. There were in attendance in 1915 in the law department 46 students, in the arts department 87, in the engineering department 39, and in the preparatory department 153. The faculty numbered 34. The value of the grounds and buildings was $720,000. The president in 1915 was Walter Francis Thornton, S.J.

SANTA CLAUS, or **KLAUS,** kląz. See NICHOLAS, SAINT.

SANTA CROCE, krō'chȧ (It., holy cross). A famous church in Florence, formerly belonging to the Franciscans, and the Pantheon of Florence, where its illustrious dead lie buried. It was begun in 1294 (possibly 1295), after the designs of Arnolfo di Cambio (q.v.), the principal Florentine architect of the period, and was nearly completed before his death (c.1302). In 1320 the first services were held, and in 1442 it was formally dedicated in the presence of Pope Eugenius IV. The graceful, slender tower was completed after the designs of Baccani in 1847, and the unfortunate façade was built in 1857–63. The building is in the Florentine Gothic style, simple and austere both in design and decoration. Santa Croce is an important museum of Florentine art belonging to the fourteenth and fifteenth centuries. Especially noteworthy are the celebrated frescoes from the life of John the Baptist and St. Fran-

cis, by Giotto, in the Bardi and Peruzzi chapels. Other treasures are a "Crucifixion," an "Annunciation" and a bronze statue of St. Louis of Toulouse by Donatello, and a rich marble pulpit in the early Renaissance style by Benedetto da Majano. Among those buried within the church are Michelangelo (whose monument is by Vasari), Alfieri (with a monument by Canova), Machiavelli, Galileo, Cherubini, and Rossini. There is also a fine monument to Dante by Stefano Ricci. From Arnolfo's Gothic cloisters adjoining the church is the entrance to what is perhaps the most perfect small chapel of the early Renaissance, the Capella dei Pazzi (1420), by Brunelleschi, who also designed the second cloisters of the church. Consult: Moïse, *Santa Croce* (Florence, 1845); Carl Frey, *La Loggia de' Lanzi* (Berlin, 1885); E. V. Lucas, in *A Wanderer in Florence* (London, 1912).

SANTA CRUZ, sän'tȧ krōōs'. A territory of Argentina, occupying the southern part of Patagonia (Map: Argentina, E, F 7). Area, estimated at 109,142 square miles. The climate is dry, cold, and very healthful. The principal rivers, the Deseado, Chico, Santa Cruz, and Gallegos, traverse the territory from west to east. The chief industry is sheep raising; agriculture is little developed. Pop., 1912 (est.), 8620. The capital is Gallegos (pop., 1200).

SANTA CRUZ. A department of east Bolivia (Map: Brazil). Area, estimated at 141,362 square miles. It is covered with great forests in the north, while the southern part belongs to the Llanos de Chiquitos. The northern part of Santa Cruz is drained by the Mamoré. The Río Grande, forming one of its head streams, is navigable. The climate is hot and unhealthful, but the soil is fertile. The principal agricultural products are maize, cotton, rice, indigo, sugar cane, cocoa, and fruits. The forests produce cabinetwoods, lumber, dyewoods, rubber, and medicinal plants. The mineral wealth consists of petroleum, iron, quicksilver, gold, and silver. Pop., 1913 (est.), 236,000, considerably more than half of whom were Indians. Capital, Santa Cruz de la Sierra (q.v.).

SANTA CRUZ. The capital of the Province of La Laguna in Luzon, Philippine Islands, situated on the east shore of the Bay Lagoon, 35 miles southeast of Manila (Map: Philippine Islands, C 3). It has well-built public and ecclesiastical buildings. It has an active trade with Manila by way of the lagoon and the Pasig River and is noted for the manufacture of palm brandy. Pop., 1903, 12,747.

SANTA CRUZ, or Sainte Croix. The largest of the Danish West India Islands, situated 37 miles south of St. Thomas (Map: West Indies, F 3). Area, 74 square miles. The surface is hilly in the interior. Along the coasts there are level tracts of fertile soil which produce sugar and rum. Santa Cruz was discovered by Columbus on his second voyage. It was sold by France to a Danish company in 1733. Pop., 1901 (est.), 18,590; 1911, 15,467. Chief town, Christiansted (q.v.).

SANTA CRUZ, sän'tȧ krōōz'. A city and the county seat of Santa Cruz Co., Cal., 76 miles south of San Francisco, at the mouth of the San Lorenzo River, on Monterey Bay and on the Southern Pacific Railroad and several steamship lines (Map: California, D 5). It is a watering place of considerable repute. There are the curiously carved cliffs along the coast, Sequoia Park, and the celebrated Big Tree forest, a few miles distant. The public library, post office, casino, and city park are noteworthy features. The leading manufactures are leather, lime, cement, asphalt, gunpowder, and lumber products. Santa Cruz has adopted the commission form of government. On the site of Santa Cruz a Spanish mission of the same name was established in 1791. Pop., 1900, 5659; 1910, 11,146; 1915 (U. S. est.), 14,038; 1920, 10,917.

SANTA CRUZ, sän'tȧ krōōs', Alvaro de Bazán, first Marquis of (1526–88). A Spanish admiral born at Granada. Selected by Don John of Austria to command a division of the allied forces which destroyed the Turkish fleet in the battle of Lepanto, Santa Cruz twice saved the day. In 1583 he won the victory of Terceira over the forces of the Portuguese pretender and his allies. It was Santa Cruz who first suggested to Philip II the Spanish Armada. For his important part in its organization, see Armada. He died at Lisbon a few months before the Armada sailed on its disastrous cruise under another and a less competent commander. His death was undoubtedly hastened by unjust reproaches of the King. Santa Cruz's knowledge of, and experience in, ship construction were unusually great for a sea officer of his time.

SANTA CRUZ, sän'tȧ krōōs', Andres (1794–1865). A Bolivian general and politician, born at La Paz in Bolivia. In 1820 he joined the patriots and was promoted to the rank of brigadier general in 1822 for his services at Pichincha. After the defeat at the Desaguadero he went to Lima, was employed by Bolívar on various diplomatic missions, and was military chief and president of the council of government previous to the election of Lamar as President of Peru in 1827. In 1828 he was elected President of Bolivia for 10 years and immediately began to apply his plans for uniting Peru and Bolivia. By 1836 he had so far subjugated Peru that he was appointed by Congress protector of the confederation. Chile, alarmed at these successes, began war against Santa Cruz and defeated him completely at Yungay in 1839, after which he went into exile to Europe.

SANTA CRUZ DE LA PALMA, krōōth' dȧ lȧ päl'mȧ. The capital of Palma, one of the Canary Islands, situated on a bay of the east coast of the island (Map: Spain, F 4). It is a thriving commercial town with a good harbor and shipyards, shipbuilding being the chief industry. It exports fruit, wine, cochineal, tobacco, and silk. Pop., 1900, 7383; 1910, 7542.

SANTA CRUZ DE LA SIERRA, krōōs' dȧ lȧ sē-ĕr'rȧ. Capital of the Department of Santa Cruz, Bolivia, situated 170 miles northeast of Sucre (Map: Brazil, E 7). It has a cathedral under construction and a national college with faculties of law, medicine, and theology. The local industries are tanning and the manufacture of boots and shoes, saddlery and blankets. There are also cigarette factories, distilleries, saw, flour, and sugar mills. It carries on an active trade with the Indians of the plains. Pop., 1914 (est.), 20,000.

SANTA CRUZ DE NAPO, dȧ nä'pō. A town of Marinduque, Philippines, situated at the head of a bay on the northeast coast of the island. It has a well-protected harbor with safe anchorage for large steamers and provided with a stone breakwater 1000 yards long. Pop., 1903, 16,350.

SANTA CRUZ DE TENERIFE, tä'nä-rĕ'fĕ (Eng. *Teneriffe*, tĕn'e-rĭf'). The capital of the Canary Islands, situated at the head of a bay near the northeast end of the island of Teneriffe (Map: Spain, F 4). It is defended on the seaward side by several forts and is well built, with straight streets and modern houses. The principal square, the Plaza de la Constitución, contains a large monument with a statue by Canova. The principal buildings are the house of the Captain-General, the civil government building, and the hospitals; the town has a high school, a school of navigation, a preparatory academy, a public library, and a museum of natural history. An aqueduct 5 miles long supplies water from the mountains. The harbor is protected by a breakwater and has good facilities for coaling. Santa Cruz is the second seaport in the Canary Islands. It exports sugar, cochineal, almonds, wine, cattle, and agricultural products. Pop., 1900, 35,055; 1910, 63,004.

Santa Cruz was founded by the Spaniards about 1496. It was attacked by an English fleet under Blake in 1657 and by Nelson in 1797; it was in the latter engagement that Nelson lost his arm. The city became capital of the islands in 1822.

SANTA CRUZ INDIANS. See COSTANOAN.

SANTA CRUZ ISLANDS. An unimportant group in Melanesia, discovered by Mendaña in 1595. They lie to the north of the New Hebrides (Map: Australasia, J 4). The name Santa Cruz properly applies to the high island of Deni with two outliers. South of Deni lie Tupua and Vanikoro, both high islands, of which the latter is worthy of note only as the scene of the loss of La Pérouse and his expedition. North of Deni lies a group of 10 or a dozen small coral islands known as the Swallow Islands. All the Santa Cruz islands are unhealthful, but very fertile. Formerly the islands supported a large population, but the labor trade and introduced diseases have depopulated them, and the present estimate of population is less than 2000 and decreasing. The islands are cared for by an extension of the Anglo-French convention of the New Hebrides with joint commissioners resident at Vila.

SANTA FÉ, fā. A province of northeast Argentina (Map: Argentina, G 4). Area, 50,916 square miles. The surface is mostly level, well wooded in the north part, and a vast grassy plain in the south. The soil is especially adapted for agriculture and stock raising. The climate is healthful, and there is ample rainfall. The chief rivers are the Paraná and its tributary the Salado. The agricultural lands are found chiefly along the Paraná, where there are large plantations. Wheat, corn, flax, and lucerne are the chief agricultural products. There are a number of large industrial establishments, such as flour and saw mills, tanneries, sugar mills, foundries, and brick yards. The railway mileage of the province is the largest in the Republic. Pop., 1912 (est.), 915,133. The chief commercial town is Rosario (q.v.), on the Paraná, and the capital is Santa Fé (q.v.).

SANTA FÉ. The capital of the Province of Santa Fé, Argentina, on an arm of the Paraná River at its confluence with the Salado, 95 miles north of Rosario (Map: Argentina, G 4). It is well built, of modern aspect, and has several lines of street railroads. Its chief institutions are a large Jesuit college, a normal school, a seminary, and a university. Railroads connect it with all the important cities of the Republic, and a short road runs to its port, Colastiné. The chief industry is shipbuilding, and the principal exports are lumber, wool, and cattle. Pop. (commune), 1914 (est.), 48,600. Santa Fé was founded in 1573 by Juan de Garay.

SANTA FE. The capital of New Mexico and the county seat of Santa Fe County, on Santa Fe River and on the Atchison, Topeka, and Santa Fe, the New Mexico Central, and the Denver and Rio Grande railroads (Map: New Mexico, D 3). The city as originally laid out by the Spaniards has been much changed since the American occupation. The old Spanish buildings which still remain are constructed mostly of adobe. The main business structures centre about the Plaza, upon one side of which is the palace, an edifice where the various governors of the Territory from the early Spanish times to 1909 resided. In the vicinity are many remains and ruins of cliff and cave dwellings of the Pueblo Indians, and of mission churches about 300 years old. In the palace is located the Museum of New Mexico, with archæological, historical, and art collections, mural paintings, and interesting remains of the Indian and Spanish periods. Other places of interest are the cathedral of San Francisco, the church of San Miguel, the Scottish Rite Cathedral, and old Fort Marcy. Santa Fe also has the capitol, the executive mansion, the federal courthouse, a penitentiary, a federal building, a hospital, St. Vincent's Sanitarium, Sunmount Tent City, and St. Vincent's Orphan Asylum. Educational institutions comprise St. Michael's College, schools for the deaf and dumb, the Loretto Convent, Allison Mission School, Mary E. James Mission School, the School of American Archæology, an outdoor summer school among prehistoric cliff dwellings, and the government and St. Catherine's Indian schools. The most important industries are stock raising and mining and the manufacture of Indian blankets, wool, and filigree jewelry. There are also deposits of kaolin and clay in the vicinity. Pop., 1900, 5603; 1910, 5072.

A party of Spaniards made a settlement here about 1606 under the name La Ciudad Real de la Santa Fé de San Francisco de Assisi, opened up extensive gold and silver mines, and built mission churches and schools. In 1682 the Indians captured the place and expelled the Spaniards, who, however, regained possession in 1693. On Aug. 18, 1846, it was occupied without opposition by United States troops under Gen. S. W. Kearny. In 1851 it was chartered as a city and became the capital of the newly organized Territory of New Mexico. Consult H. H. Bancroft, *History of Arizona and New Mexico* (San Francisco, 1884), and Hodge, "Santa Fe," in L. P. Powell (ed.), *Historic Towns of the Western States* (New York, 1901).

SANTA FÉ DE BOGOTÁ, dā bō'gō-tä'. The capital of Colombia. See BOGOTÁ.

SANTA FÉ DE GUANAJUATO. See GUANAJUATO.

SANTA HERMANDAD. See HERMANDAD.

SANTA ISABEL. See FERNANDO PO.

SAN'TALS, or SON'THALS. A people of Dravidian stock in western Bengal, northern Orissa, and Bhagalpur. They are of low stature and dolichocephalic, with dark skins and wavy hair. Some of the Santals are good agriculturists; others, in the more remote parts of the country, are still practically in the hunting

stage. Except the few who have been converted to Hinduism or to Christianity, the Santals are nature worshipers, with a sun cult and a belief in evil spirits. Their native system of government is village patriarchism. The Santals are generally monogamous, although polygamy and polyandry are not at all unknown among them. A grammar of the Santal language has been published (Benares, 1873) by Skrefsrud, and a collection of *Traditions and Institutions of the Santhals*, written down from the dictation in Santali of Kolean Haram, an old Santal, appeared at Benagoria in 1887. Consult Man, *Sonthalia and the Sonthals* (London, 1867), and Dalton, *Descriptive Ethnology of Bengal* (Calcutta, 1872). See KOLARIAN PEOPLES.

SANTA MARGHERITA LIGURE, märˈgä-rēˈtä lĕ-gōōˈrā. A seaport and winter and bathing resort in the Province of Genoa, Italy, 15 miles east-southeast of Genoa. Coral fisheries are carried on, and there are manufactures of lace, olive oil, and rope. Pop. (town), 1911, 4907.

SANTA MARÍA, mä-rēˈä. A town of north Luzon, Philippine Islands, in the Province of Ilocos Sur, situated 2 miles from the coast and 11 miles southeast of Vigan. Pop., 1903, 10,082.

SANTA MARÍA, DOMINGO (1820–89). A Chilean lawyer and politician, born in Santiago. He was educated in the National Institute and the University and in 1845 became a professor in the former. In 1847 he was admitted to the bar and was appointed intendant of Colchagua. He took part in the Liberal revolt of 1851 and was forced into exile, but returned to Chile in 1853. Involved in the movement against President Montt in 1858, he was again exiled to Europe. Upon his return to Chile he held the positions of Minister of Finance (1863–64), Envoy to Peru, judge of the Supreme Court (1868), and president of the Court of Appeals (1874). He was a member of President Pinto's cabinet, with the portfolios of Foreign Affairs, the Interior, and War, and was President of the Republic in 1881–86. Many of the present railroads were built during his administration, the public debt was reduced, the Araucanian Indians were brought into subjection, and the disputes with Peru arranged on a more secure peace basis. His works include *Biografía de José Miguel Infante* (1853) and *Memoria sobre los sucesos ocurridos desde la caida de D. Bernardo O'Higgins en 1823* . . . (1858).

SANTA MARIA DEL FIORE, dĕl fē-ōˈrā. The duomo or cathedral of Florence (q.v.).

SANTA MARÍA DE PANDI, pänˈdē. A town of Luzon, Philippine Islands, in the Province of Bulacán, situated near the Manila-Dagupán Railroad, 9 miles east of Malolos. It was a handsome and well-built town, but, as it was used as a military centre by the insurgents, it was burned by the American troops and now consists chiefly of nipa huts. Pop., 1903, 10,791.

SANTA MARIA DI CAPUA VETERE, käˈpōō-ä vāˈtä-rā. A city of south Italy, in the Province of Caserta, 15 miles north of Naples, located on the site of ancient Capua, of whose stones it was partly rebuilt (Map: Italy, E 4). It is an active, thriving, attractive place, with a population of 20,541 in 1912, according to Baedeker. Its large reconstructed cathedral, dating from 1766, has five naves and 52 columns. The Roman ruins attract many sight-seers. Ancient Capua in Campania was second only to Rome among the cities of Italy in wealth and population. Under the name of Volturnum it was the chief of the 12 cities said to have been founded by the Etruscans in this part of Italy. In 343 B.C. it formed an alliance with Rome for protection against the Samnite tribes of the mountains. After the battle of Cannæ (q.v.), in 216 B.C., the popular party opened the gates to Hannibal, whose army rapidly degenerated here under the new corrupting surroundings. The Romans obtained possession of the city in 211 B.C. In the fifth century A.D. Capua was devastated by the Vandals under Genseric. It recovered its prosperity again to some extent, but was totally destroyed by the Saracens in 840. Among the antiquities one of the most remarkable is the amphitheatre constructed of travertine, of which well-preserved arches, corridors, and seats for spectators still remain. Consult K. Baedeker, *Southern Italy and Sicily* (16th Eng. ed., Leipzig, 1912).

SANTA MARIA DI FALLERI. See FALERII.

SANTA MARIA MAGGIORE, mäd-jōˈrā. One of the oldest churches in Rome, reputed to have been built about 352 by Pope Liberius and reërected in the fifth century. Old marble columns and mosaics of this date are preserved in the nave, also fine fifteenth-century mosaics of the Coronation of the Virgin. Over the altar in the Borghese Chapel is an old picture of the Virgin ascribed to St. Luke. This is one of the five patriarchal churches and derives its name of St. Mary Major from its importance among the 80 churches in Rome dedicated to the Virgin.

SANTA MARTA, märˈtä. The capital of the Department of Magdalena, Colombia, on the Caribbean coast, 45 miles east of the mouth of the Magdalena River (Map: Colombia, C 1). It has a cathedral, market, and government building, and is a port much frequented by vessels plying among the Antilles. Pop., 1912, 8348. Santa Marta was founded in 1525. It was long an important centre of exploration and conquest. Near the town is the hacienda where Simon Bolívar died in 1830.

SANTA MAURA, mouˈrä, or LEUCADIA (MGk. *Levkas*). One of the Ionian Islands, belonging to Greece, off the west coast of Acarnania, from which it is separated by a passage about a mile wide (Map: Greece, B 5). Area, 109 square miles. It is traversed from north to south by a range of hills which end at the southern extremity in high white cliffs. The inhabitants, who number 29,471, are engaged chiefly in fishing. Exports from the island consist of wine and salt. Chief town, Amaxichi (q.v.).

SANTA MONICA, sănˈtä mŏnˈī-kä. A city in Los Angeles Co., Cal., 15 miles by rail west of Los Angeles, on the Pacific Ocean, and on the Pacific Electric Railroad (Map: California, G 9). Santa Monica is a popular summer resort on account of its fine bathing and boating facilities. It has a large amusement pier, a municipal dancing pavilion, and a concrete pier, 1600 feet long. Noteworthy institutions are the Carnegie library, St. Catherine's Hospital, and the Santa Monica Military Academy. The city also has important shipping interests and is the headquarters for several motion-picture concerns. Santa Monica adopted the commission form of government in 1915. Pop., 1900, 3057; 1910, 7847; 1920, 15,252.

SANTANA, sän-täˈnä, PEDRO (1801–64). President of Santo Domingo, born at Hincha.

In 1844, when Juan Pablo Duarte rebelled against Haitian rule, Santana inflicted upon the Haitians a crushing defeat at Azua that practically decided the war. Soon afterward he was proclaimed supreme chief of the Dominican Republic, and upon the organization of a regular government he was elected its first President. In 1848 he was succeeded by Jiménez. At the time of the Haitian invasion under Soulouque (see FAUSTIN I) in 1849, Santana with a force of scarcely 400 routed Soulouque's force of 4000. In 1853 he was again elected chief magistrate. During this administration he repelled another invasion of the Haitians. In 1856 he was deprived of power and succeeded by Báez. In 1858, however, Báez was driven into exile and Santana again became President (1861). He at once arranged for and consummated the reunion of Santo Domingo with Spain. Although appointed Captain-General, he soon resigned. In August, 1863, when an illiterate peasant organized the rebellion which finally swept the Spaniards from the island, Santana went to the city of Santo Domingo and offered his services in vain to the Spanish authorities. His death occurred only a few months before Spain acknowledged the regained independence of Santo Domingo.

SANTANDER, sän'tän-dâr'. The capital of the Province of Santander in Old Castile and one of the principal seaports of north Spain, on the north shore of a landlocked inlet of the Bay of Biscay (Map: Spain, D 1). There are few buildings of interest except the old Gothic cathedral dating from the thirteenth century. The town has a provincial high school, a normal and a nautical school, and a theological seminary. On the beach of Sardinero, an outlying suburb, are hotels and bathing establishments. The fisheries are important, and there are salting and pickling establishments, sugar and oil refineries, iron foundries, and manufactures of glass, candles, soap, perfumes, sulphuric acid and other chemicals, and cotton goods. The harbor is spacious and deep and provided with shipyards and extensive wharves, accessible for the largest ships and recently improved and enlarged. The chief exports are iron ore, preserved food, flour, paper, wine, and manufactured articles. Pop., 1910, 65,046.

SANTANDER. A department of Colombia (Map: Colombia, C 2). Area, 13,322 square miles. It is traversed by the Eastern Cordillera of the Andes, and the greater part of its surface is mountainous. In the plains along the Magdalena are cultivated coffee, sugar, cacao, tobacco, rice, and wheat. Gold, silver, and other minerals are mined to some extent. Pop., 1912, 400,084. Capital, Bucaramanga (q.v.).

SANTANDER, FRANCISCO DE PAULA (1792–1840). A Colombian statesman, born at Rosario de Cúcuta. He was educated for the law, but upon the proclamation of independence in 1810 joined the patriots and fought under Nariño and Bolívar, and was on Bolívar's staff in 1817–18. He was promoted to the rank of general of division at the battle of Boyacá in 1819, was chosen Vice President of the State of Cundinamarca, and in 1821 was elected Vice President of Colombia. Reëlected in 1827, he ruled the country with wisdom and decision during Bolívar's repeated absences. Afterward he opposed Bolívar and was condemned to death for supposed complicity in a conspiracy to murder him. Santander's sentence was changed to exile, and he remained abroad until his election to the presidency of New Granada in 1832. His administration was beneficial, and after his term ended in 1836 he was twice elected to Congress. He wrote *Ayuntamientos para las memorias de Colombia y Nueva Granada* (1837).

SANT' ANGELO, sän tän'jâ-lô, CASTLE OF. See HADRIAN, TOMB OF.

SANTAREM, sän'tà-rân'. A river port of Portugal, capital of the District of Santarem, on the right bank of the Tagus, 40 miles northeast of Lisbon (Map: Portugal, A 3). It carries on an active trade in wine and olive oil with Lisbon. Pop., 1900, 8704; 1910, 9897.

SANTAREM. A town of the State of Pará, Brazil, 440 miles west of the city of that name, on the right bank of the Tapajós, near its confluence with the Amazon (Map: Brazil, G 4). It controls the rubber trade of the Tapajós. The rich agricultural and pastoral region also produces cacao. Near Santarem is an agricultural colony composed of emigrants from the southern United States. Pop. (est.), 6000.

SANTA RITTA DURÃO, sän'tà rīt'tà dōō-roun', JOSÉ DE (1737–84). A South American poet, born near Marianna, Minas Geraes, Brazil. He studied in the Jesuit College at Rio de Janeiro and at the University of Coimbra and entered the Order of St. Augustine at Leira. Afterward he lived in Rome and about 1778 returned to Coimbra as professor of theology and prior of his order. His most important work is the epic *Caramurú* (1781; 4th ed., 1845), a description of the discovery and colonization of Bahía by Diogo Alvares. Consult José Maria da Costa e Silva, *Ensaio biographico-critico sobre os melhores poetas portuguezes* (10 vols., Lisbon, 1850–56), and J. M. Pereira da Silva, *Os varões illustres do Brazil*, vol. i (2 vols., Paris, 1858).

SANTA ROSA, rō'sà. The capital of the Department of Copán, Honduras, 150 miles northwest of Tegucigalpa (Map: Central America, C 3). It has a college. Gold, silver, and copper mines are near; tobacco, coffee, sugar, and grain are produced in abundance. Pop. (est.), 10,574, chiefly Indians.

SANTA ROSA. A city and the county seat of Sonoma Co., Cal., 52 miles by rail north of San Francisco, on the Southern Pacific, the Petaluma and Santa Rosa, and the Northwestern Pacific railroads (Map: California, C 4). It contains an Ursuline convent, the home and experimental gardens of Luther Burbank (q.v.), a Carnegie library, several hospitals, a county jail, and fine high-school and post-office buildings, city hall, and courthouse. Chief among the industries are wine making and fruit canning, the quarrying of basalt, and the manufacture of leather and woolen goods, flour, shoes, and lumber products. The earthquake of April 18, 1906, followed by fire, caused the loss of about 100 lives and a property destruction of $3,000,000. (See SAN FRANCISCO EARTHQUAKE.) Pop., 1900, 6673; 1910, 7817.

SANTAROSA, SANTORRE ANNIBALE DEROSSI, COUNT OF (1783–1825). An Italian patriot, born at Savigliano. Entering the service of Napoleon, he was subprefect of Spezia in 1812–14 and in the following year was a captain in the Sardinian army. Thereafter he was active in Piedmontese Liberal politics, and when the Austrians undertook to punish the rebellious Neapolitans in 1821 he organized a conspiracy to attack the Austrians. His plans failing, Santarosa was ar-

rested and narrowly escaped execution. Rescued by friends, he fled through Switzerland to Paris, where he published *La révolution piémontaise* (1822). Upon the discovery of his place of concealment he was obliged to leave Paris; subsequently he went to England and in 1824 accompanied Giacinto Collegno to Greece. There he was killed on the island of Sphacteria, while fighting for Greek independence.

SANTA ROSA DE LOS OSOS, dä lōs ō'sōs. A town of the Department of Antioquia, Colombia, near the Cauca, 170 miles northwest of Bogotá. It is in the vicinity of rich gold deposits, but antiquated methods are employed in working them. Its high altitude (8560 feet) gives it a healthful climate. Pop., 1912, 15,754.

SANTA ROSALÍA, rō'sä-lē'ä. A town of the State of Chihuahua, Mexico, 80 miles southeast of the state capital, on the National Railways of Mexico (Map: Mexico, F 4). It is celebrated for its hot sulphur baths. Pop. (est.), 8000.

SANTA TECLA, těk'lä, or NUEVA SAN SALVADOR. A town of the Republic of Salvador, about 8 miles southwest of the capital city, San Salvador, in a picturesque valley at the foot of the volcano of the same name (Map: Central America, C 4). The town is well built, with broad, straight streets and notable public edifices such as the hospital, municipal building, and the Concepción and Carmen churches. Its *plaza de armas* is the most beautiful in the Republic. Santa Tecla was founded in 1854 after the destruction of San Salvador by an earthquake. Pop. (est.), 17,904.

SANTAYANA, sän'tä-yä'nä, GEORGE (1863–). An American poet and philosopher, of Spanish parentage and born in Madrid. He graduated in 1886 from Harvard, where he became instructor in 1889 and rose to be professor of philosophy (1907–12). Thereafter he resided in Paris. In 1905 he was Hyde lecturer in France. Santayana was elected to the National Institute of Arts and Letters. His first volume of verse, entitled *Sonnets and Other Poems*, appeared in 1894. In 1896 he published *The Sense of Beauty*, an inquiry into the physical and psychological causes for the æsthetic sense in man; in 1899 appeared *Lucifer, a Theological Tragedy;* in 1900 a volume of essays entitled *Interpretations of Poetry and Religion.* Further writings include: *The Hermit of Carmel and Other Poems* (1901); *The Life of Reason; or, The Phases of Human Progress* (5 vols., 1905–06); *Three Philosophical Poets, Lucretius, Dante, and Goethe* (1910); *Winds of Doctrine* (1913).

SANTEE' RIVER. The chief river of South Carolina, formed near the centre of the State by the junction of the Congaree and Wateree or Catawba (Map: South Carolina, D 3). The stream flows southeast and enters the Atlantic Ocean by two arms about 10 miles north of Cape Romain. It has a total length of about 180 miles. Steamers can navigate to Columbia on the Congaree and to Camden on the Wateree.

SANTELMANN, sän'tel-man, WILLIAM HENRY (1863–). An American bandmaster. He was born at Offensen, Germany, and graduated from the Leipzig Conservatory. In 1887 he enlisted as a member of the United States Marine Band, but left it to serve as leader of the orchestra at the Columbia Theatre, Washington, in 1895–98. In the latter year he was appointed leader of the United States Marine Band.

SANTERAMO IN COLLE, sän'tä-rä'mō ēn kōl'lā. A town in the Province of Bari, Italy, 23 miles southwest of Bari. It markets cereals, wine, fruit, and cattle. Pop. (commune), 1901, 13,662; 1911, 13,345.

SANTERRE, sän'tĕr', ANTOINE JOSEPH (1752–1809). A French revolutionist, born in Paris. At the outbreak of the Revolution he commanded a battalion in the National Guard, took part in the storming of the Bastille, and became an ardent Jacobin. He stirred up the *émeute* of the Champ de Mars in 1791 and led in the events of June 20 and Aug. 10, 1792. As commander of the National Guard he was present at the trial and execution of Louis XVI, whose last words he ordered the drums to drown. Made general of division in 1793, he led an army against the Vendéans, but was beaten. He was arrested and imprisoned till the fall of Robespierre. After the institution of the Directory he lost all prominence.

SANTI, sän'tē, GIOVANNI (c.1435–94). An Italian painter and poet, father of Raphael. He was born in Colbordolo in the Duchy of Urbino, was a petty merchant for a time, then studied under Piero della Francesca, was influenced by Fiorenzo di Lorenzo, and seems to have been an assistant and friend of Melozzo da Forlì. He was court painter to the Duke of Urbino and painted several altarpieces, two now in the Berlin Museum; a Madonna in the church of San Francesco in Urbino, one at Santa Croce in Fano, one in the National Gallery at London, and another in the gallery at Urbino; an Annunciation at the Brera in Milan; and a Jerome in the Lateran. His work is pleasing, though mediocre. His poetry includes an epic in honor of the Duke of Urbino and a long discourse on painting. Consult Schmarsow, *Giovanni Santi* (Berlin, 1887).

SANTI, RAPHAEL. See RAPHAEL SANTI.

SANTIAGO, sän'tē-ä'gō (SÃO THIAGO). The largest and most important of the Cape Verde Islands (q.v.).

SANTIAGO. A central province of Chile (Map: Chile, E 4). Area, 5665 square miles. It is traversed in the east and west by mountain ranges inclosing a central valley. It is but scantily watered, and agriculture is possible only by irrigation. The principal river is the Maipo. Cereals, vegetables, and forage are the principal products. Much attention is given to cattle raising. Mineral deposits and springs occur in several parts of the province, and large quantities of salt are obtained from the lagoons on the coast. Pop., 1907, 516,870. Capital, Santiago (q.v.).

SANTIAGO, or SANTIAGO DE CHILE. The capital of Chile and of the Province of Santiago, situated on a small tributary of the Maipo in the central valley between the coast range and the Andes, 68 miles southeast of Valparaiso (Map: America, South, B 6). The location is picturesque, the city being surrounded by mountains on all sides. On the east tower the snow-clad Andes. Several hills rise within the city, such as the steep red porphyry crag of Santa Lucía, now a public park, about 200 feet high, on which the first settlers withstood a six years' siege by the fierce Araucanian Indians. There are several large parks within and around the city, in which irrigation maintains a luxuriant vegetation. The rainfall is very scanty, and the surrounding plains are naturally arid. The houses are generally built in the old Spanish

style, one or two stories high, with a central patio and often with extensive gardens.

Santiago is the most populous city on the entire western slope of America, with the exception of San Francisco and Los Angeles. An extensive system of street railroads traverses the city in all directions. In recent years numerous large buildings, several stories high and of solid stone construction, with artistic façades, have been erected, as well as many handsome private residences. The streets are exceptionally well paved, clean, and broad. The Alameda or Avenida de las Delicias, which divides the city in two, is one of the finest boulevards of South America. It is more than 300 feet wide, lined with several rows of poplars, and ornamented with fountains and statues, many of the latter being the spoils of the Peruvian War. The prominent buildings are the large mint, the Exposition Palace, the Hall of Congress, a magnificent opera house, the cathedral, and the university building. The University of Chile, the head of the educational system of the country, was founded at Santiago in 1743 and has faculties of law, philosophy, medicine, and science, with over 1000 students. Other educational institutions are the Pedagogical Institute (1889); the National Library (1813), with about 163,000 volumes; the National Museum (1830), one of the foremost in South America; normal, military, trade, and agricultural schools; the national astronomical observatory (1856); and a botanical garden. Santiago is connected by railroad with Valparaiso, Concepción, and Buenos Aires. Pop., 1885, 189,392; 1907, 332,724; 1912, 378,103. Santiago was founded in 1541 by Pedro de Valdivia. An earthquake on Aug. 16, 1906, did serious damage.

SANTIAGO, Battle of. See Spanish-American War.

SANTIAGO, Río Grande de, or Río Santiago. The largest river in Mexico. It rises in a small lake at the foot of the volcano of Toluca, near Mexico City, and flows under the name of Río Lerma northwest and west, emptying into Lake Chapala (q.v.). Issuing from the north end of the lake as the Río Santiago, it flows northwest and empties into the Pacific Ocean near San Blas. Its total length is about 550 miles. In its upper course it has a very swift current, and below Lake Chapala it breaks through the Sierra Madre in deep and rocky gorges, where it is obstructed by reefs and falls. Below the lake and not far from Guadalajara it forms the beautiful falls of Juanacatlán. In its extreme lower course it is very shallow, so that no part of it is permanently navigable.

SANTIAGO DE ATITLAN. See Atitlan.

SANTIAGO DE COMPOSTELA, dä kôm-pô-stä'lä, or Compostella. A celebrated town of Galicia, northwest Spain, in the Province of La Coruña, situated among the mountains some 30 miles south of Coruña (Map: Spain, A 1). Tradition ascribes its origin to the finding in the ninth century of the remains of the Apostle St. James (Santiago), the patron saint of Spain. According to the legend the spot was pointed out to Bishop Theodomir by a star, whence the place was called Campus Stellæ (field of the star), later corrupted to Compostela. A church was built over the grave, which became the goal of vast numbers of pilgrims. The church was destroyed by the Moors in 997, and in 1078 or 1082, authorities differ, the present cathedral was begun. It is a vast cruciform granite structure and the best example of the early Romanesque architecture in Spain. The façade, which dates from 1738, is very elaborately decorated in baroque style. The crypt contains the shrines of the Apostle and his two disciples. The city, which is the see of a metropolitan archbishop, contains several other churches and a large number of convents and other ecclesiastical buildings, some of which, such as the convents of San Francisco and San Martín, are of great size. The large Hospital Real, opposite the cathedral, was built in 1501 by Ferdinand and Isabella for the reception of pilgrims, who are still numerous. There are a university, founded in 1504, and several academies. Pop., 1900, 24,917; 1910, 24,637. Consult C. G. Hartley (Mrs. W. M. Gallichan), *The Story of Santiago de Compostela* (New York, 1912).

SANTIAGO DE CUBA, dä kōō'bä, properly Oriente. The largest province of Cuba, at the eastern end of the island (Map: Cuba, J 6). Estimated area, 12,468 square miles. This is the highest and most mountainous part of Cuba. The mountains are divided by the valley of the Cauto, the largest river of Cuba, which traverses the province from east to west. Along the south coast runs the well-defined range of the Sierra Maestra. In the east the range merges with the northern mountains in a wilderness of hills, ridges, and precipices. There are numerous fertile valleys in the province, yielding all the agricultural products of the island, and the mineral wealth is extensive, consisting especially of iron, and including also copper, manganese, mercury, and marble. Copper mining, formerly of very great importance, has declined. Besides iron mining, the chief industries include sugar and tobacco manufacture, cattle raising, and the exploitation of the forests, which yield fine cabinetwoods. Pop., 1899, 327,715; 1907, 455,086; 1914, 567,639. The capital of the province is Santiago de Cuba.

SANTIAGO DE CUBA. A city of Cuba, capital of the Province of Oriente. It lies at the northeastern end of the Bay of Santiago, on the southeast coast of the island, 470 miles in a straight line southeast of Havana (Map: Cuba, K 7). The bay is a harbor of the first class, very deep and capacious and completely landlocked. It is 5 miles long, with an average breadth of 1½ miles, and has an extremely narrow entrance, in one place only 220 yards wide. The entrance is protected by the fortresses of Morro and Socaba, which crown the rocky cliffs, but are more picturesque than formidable. Within the entrance are the Batería de la Estrella and several minor defenses. The bay and the city are inclosed by mountains which cut off the sea breezes and render the location hot and unhealthful. The mean temperature in summer is 88° and in winter 82°. The city is built on a sloping amphitheatre of hills, with generally crooked and hilly streets and one-storied houses. Previous to the American occupation in 1898 the streets were badly paved and unclean, while yellow fever was prevalent, but these conditions are very greatly improved. Water is brought to the city by an aqueduct, but the supply is irregular. The best street is the broad and level promenade along the water front. The Plaza de Céspedes (formerly Plaza de Armas), which has four parterres planted with trees, is surrounded by some of the best buildings in the city, including the municipal building (formerly the Governor's Palace) and the cathedral. The latter is

one of the oldest and largest churches in the island. The municipal building, theatre, market, military hospital, and the Hospital de Caridad are modern buildings, the last-mentioned being one of the best in the city. The industries are largely dependent on the rich mining districts in the neighborhood. Copper and manganese are mined, but the iron mines are the most extensive; the ore is largely exported to the United States. In the city are iron foundries and machine shops and also a number of tobacco factories. The commerce is very extensive both with foreign countries and with the remainder of Cuba. The domestic trade, which until 1902 was carried on chiefly by coasting steamers, was stimulated at that time by the completion of the Cuban main trunk railroad traversing the whole length of the island from Havana to Santiago. The exports are tobacco, coffee, sugar, iron ore and manganese, and cabinetwoods. Pop., 1907, 45,470, of whom 56.7 per cent were colored and 13.6 per cent foreign-born; 1914, 61,513.

Santiago was founded in 1514 by Diego Velásquez. It was the capital of the island from 1515 to 1556. In common with other towns on the Spanish Main it suffered many vicissitudes from pirates and hostile fleets. In the Spanish-American War of 1898 it became the chief objective point of the American attack on account of the fact that the Spanish fleet under Admiral Cervera had taken refuge in the harbor. The city was invested by the American army under General Shafter and by a blockading squadron under Sampson. The heights of El Caney and San Juan, in front of the town, were stormed on July 1; the fighting continued on the 2d; on July 3 the Spanish fleet, attempting to escape, was destroyed outside the harbor entrance; and on July 14 the commanding general, Toral, capitulated, the formal surrender taking place on July 17. See SPANISH-AMERICAN WAR.

SANTIAGO DE CUBA, SOCIETY OF THE ARMY OF. An hereditary military association, organized in Santiago de Cuba on July 1, 1898, and completed at Camp Wickoff, Montauk Point, Long Island, on Sept. 15, 1898. It has for its object to preserve the memory of the events of the campaign which resulted in the capture of Santiago on July 17, 1898. It admits to membership all those officers and soldiers of the United States army who constituted the expeditionary force to Santiago de Cuba and who worthily participated in the campaign between the dates of June 14 and July 17, 1898. The insignia consists of a badge pendent from a ribbon. The badge is in the form of a Maltese cross. The colors of the ribbon are those of Spain, yellow and red. The motto of the society is, "As he died to make men holy, let us die to make men free." The membership is about 3500.

SANTIAGO DE GUATEMALA. See GUATEMALA.

SANTIAGO DE GUAYAQUIL. See GUAYAQUIL.

SANTIAGO DE LAS VEGAS, dā lās vā'gās. A town in the Province of La Habana, Cuba, situated in a healthful location 8 miles south of Havana (Map: Cuba, C 3). Its leading industry is the manufacture of tobacco. Pop., 1899, 7151; 1907, 6462.

SANTIAGO DEL ESTERO, ĕs-tā'rō. A province of Argentina (Map: Argentina, G 3). Area, estimated at 55,365 square miles. With the exception of the western part, which is somewhat mountainous, the surface is generally level and is very largely covered with forests, though the southern part consists more of open pampas and takes in a portion of the Salinas Grandes. It is watered by the Saladillo and the Salado and has a fertile soil. The climate is dry and healthful, but very hot in summer. Lumbering and agriculture are the chief industries. The principal products are sugar cane, vines, wheat, corn, alfalfa, and tobacco. Stock raising also is carried on. Pop., 1912 (est.), 227,000. Capital, Santiago del Estero (q.v.).

SANTIAGO DEL ESTERO. The capital of the province of the same name, in Argentina, situated on the river Dulce, on the railroad lines from Tucumân to Córdoba and Santa Fé (Map: Argentina, G 3). It has a national college and a normal school. Pop., 1912 (est.), 20,000. It was founded in 1553, being the oldest town in the Republic.

SANTIAGO DE LOS CABALLEROS, dā lōs kä'bà-lyā'rōs. The capital of the province of the same name, Santo Domingo, on the right bank of the Yaquí River, 24 miles south of Puerto Plata, with which it has railway connection (Map: West Indies, E 3). It is situated in the midst of the most fertile and healthful valley of the Republic, known as the Vega Real, and is the largest town of the interior, with a flourishing trade in tobacco, coffee, cacao, and hides. Pop. (est.), 12,000.

SAN'TIAM. See KALAPUYA.

SANTILLANA, sän'tē-lyä'nà, IÑIGO LÓPEZ DE MENDOZA, MARQUÉS DE (1398–1458). A Spanish soldier, poet, and scholar, born at Carrión de los Condes, Old Castile, the son of the Gran Almirante de Castilla, Diego Hurtado de Mendoza, and nephew of the Grand Chancellor Pedro López de Ayala. From early manhood a prominent figure at the court of Juan II of Castile, he was invested with the Marquisate of Santillana for his successful campaign against the Moors of Granada in 1437–39 and was created Conde del Real de Manzanares for his part in deciding the battle of Olmedo (1445). He joined the conspiracy which brought about the downfall of the favorite Alvaro de Luna in 1453, but after 1454 took less and less part in public affairs, devoting himself chiefly to literary pursuits, and died at Guadalajara. While not an original genius, Santillana was an extremely skillful versifier, gifted with unusual imitative powers which enabled him to reproduce with great felicity the characteristics of the most dissimilar writers. He contributed much towards the transformation of Castilian poetry after classical Italian and courtly Provençal models and was the first in Spain to compose sonnets in imitation of Petrarch. These are mainly of historical interest, while genuine lyrical charm pervades his *Serranillas* (pastorals), of which the song of the "Vaquera de la Finojosa" attained the widest popularity. Among his didactic poetry are to be especially noticed the *Proverbios* or *El Centiloquio* (1449), a collection of 100 proverbs in eight-line stanzas; the *Diálogo de Bías contra Fortuna* (1448); and the *Doctrinal de privados* (1453). The dream dialogue *Comedieta de Ponza* is an allegorical poem in Dantesque manner, founded on the disastrous naval combat off Ponza in 1435, in which the kings of Aragon and Navarre and the Infante of Castile were taken prisoners by the Genoese. Santillana's complete *Obras* were edited by Amador de los Rios (Madrid, 1852). Consult: George Ticknor, *History of Spanish Literature*, vol. i (6th ed., 3 vols.,

Boston, 1888); Bernardo Sanvisenti, *I primi influssi di Dante, del Petrarca, e del Boccaccio sulla litteratura spagnuola* (Milan, 1902); Marcelino Menéndez y Pelayo, "Historia de la poesía castellana en la edad media," vol. ii, in *Obras completas*, vol. v (Madrid, 1914).

SANT'LEY, Sir Charles (1834–1922). An English barytone singer, born in Liverpool. He studied singing in Italy, later with García in London, and appeared on the stage first in 1857. In 1859 he married Gertrude Kemble, a well-known soprano. For some years he was with the Carl Rosa and other opera companies, but his greatest successes came on the concert and oratorio platform. He toured with great success in America in 1871 and 1891, in Australia in 1889–90, and in Cape Colony in 1893 and 1903. He was knighted in 1907. He published: *Student and Singer* (1892); *The Art of Singing* (1908); *Reminiscences of my Life* (1909). The ballads, songs, and Church music of Santley are well known.

SANTO DOMINGO, sän'tō dō-mĭŋ'gō, properly Dominican Republic. A republic in the West Indies occupying the eastern and larger part of the island of Haiti (q.v.), with an estimated area of 18,756 square miles (Map: West Indies, E 3). Through the centre of the western part of Santo Domingo extend the Cordilleras del Cibao. Through the eastern part stretches the Muertos Range. Though mountainous, the country, which is richly forested, lends itself readily to tillage. The principal products are sugar and cacao; sugar is cultivated on extensive plantations, but largely by foreign capitalists. Other important products are coffee, tobacco, cotton, and bananas and other fruits. There are valuable forests of mahogany. Mining is little developed, but there are deposits of iron, gold, copper, quicksilver, petroleum, coal, and salt.

Foreign trade has shown a notable development since 1897. In that year imports and exports were valued at $2,246,000 and $3,568,000 respectively; in 1905, $3,096,263 and $6,896,098; in 1913, $9,271,000 and $10,470,000. The largest exports are sugar and cacao ($3,120,000 and $4,651,000 respectively in 1913). Other exports are leaf tobacco, bananas, coffee, hides and skins, woods, and beeswax. Over 60 per cent of the trade is with the United States. The chief ports are Santo Domingo, Sánchez, and Puerto Plata. The communication and transportation facilities are utterly inadequate. There are about 175 miles of railway, exclusive of light railways on some of the large plantations. Lines extend to the interior from Puerto Plata and Sánchez. The constitution of Santo Domingo, adopted in 1844 and repeatedly modified since then, provides for a President elected indirectly for six years and assisted by an appointed cabinet. The legislative power is vested in a National Congress consisting of the Senate (12 members, elected for six years) and the Chamber of Deputies (24 members, elected for four years). The governors of the provinces, the prefects, and magistrates are appointed by the President. Formerly the finances of the Republic were in a deplorable state. A treaty with the United States authorized a loan of $20,000,000 for the conversion of the debt and established an American receivership of customs from April 1, 1905. Since then obligations have been met promptly. Revenue and expenditure for the year 1913–14, $5,035,250 and $4,890,216. Revenue is derived principally from customs. The standard of value is the American gold dollar, adopted in 1897. The Roman Catholic religion is recognized by the state. Primary instruction is free and nominally compulsory, and a number of secondary schools are maintained by the state. The Republic maintains a standing army of one regiment of infantry and one battery of artillery, 800 officers and men. There is a rural guard numbering 500 officers and men. There is one gunboat. Pop., 1913 (est.), 708,000; this figure by some is regarded as excessive. The population is composed principally of persons of pure Spanish blood and a mixed race of white, aboriginal, and negro elements. The predominating language is Spanish. The capital is Santo Domingo.

History. The history of Santo Domingo forms a part of that of Haiti (q.v.) till 1844. In February of that year the inhabitants of the Spanish part of the island proclaimed their independence under the leadership of Don Pedro Santana, who became first President of the Dominican Republic. In 1849 Buenaventura Báez was chosen President, and for the next 12 years Santana and Báez alternated in the exercise of absolute powers. In 1861 Santana proclaimed the reannexation of Santo Domingo to Spain. A successful revolt against Spanish rule occurred in 1863, and Spain recognized the independence of the Republic (1865). While President, Grant sent Gen. O. E. Babcock to inquire into the conditions of the island and its resources. Babcock negotiated a treaty of annexation (Nov. 29, 1869), which was ratified by the Dominican people, but was rejected by the United States Senate by a tie vote. After the presidency of Gonzales (1873–79) there came a period of disturbed politics. In 1884 Ulisse Heureaux was chosen President and after two years again obtained office. He ruled with resolution and reestablished order, but perished by assassination in October, 1899. He was succeeded by Jiménez, who in turn was driven out by General Vásquez in 1902. The latter was expelled in April, 1903, by General Vos y Gil, who in November was overthrown by Jiménez. In 1904 C. F. Morales became President. The United States government, in February, 1905, entered into an agreement with the Dominican government by which the former undertook to adjust all foreign obligations and for that purpose to take charge of the Dominican customhouses. A special United States commissioner in 1906 found that the $20,000,000 of foreign claims was largely unjustified and that the foreign debt might be placed at $10,000,000.

In 1908 a new constitution was adopted, and Ramón Cáceres, who had filled out the preceding unexpired term, was elected President for six years. Cáceres was assassinated in 1911, and Eladio Victoria was chosen as his successor. Political unrest and revolution broke out the following year and have continued intermittently since. Victoria was forced to resign (November, 1912), and Archbishop Alejandro Nouel was made provisional President. He served less than a year and was succeeded by José Bordas Valdes. During the administration of Bordas public works and railway extension were encouraged, the decimal system was established, a census was taken, and a pure-food law was enacted.

A serious revolt occurred in 1913, and the government forces bombarded Puerto Plata. American and British warships intervened to

protect lives and property, and upon pressure from the United States the rebels surrendered. Early in 1914 Bordas was unsuccessfully impeached for the misuse of funds. A strong anti-administration party now sprang up, and a new uprising broke out. Puerto Plata was again bombarded, but the United States commander fired on and silenced the besieging batteries of President Bordas. In August, 1914, a United States mediatory commission secured an agreement for the establishment of a provisional government. President Bordas resigned, and Dr. Ramón Báez was made provisional President. At the elections held under the supervision of the United States Enrique Jiménez was elected chief magistrate. In April, 1915, a revolutionary movement occurred and United States war vessels were for some time in Dominican waters.

Bibliography. Gabb, "On the Topography and Geology of Santo Domingo," in *Transactions of the American Philosophical Society* (Philadelphia, 1873); Abad, *La República Dominicana: reseña general y estadística* (Santo Domingo, 1889); Merino, *Elementos de geografía física, política é histórica de la República Dominicana* (ib., 1889).

SANTO DOMINGO. The capital of the Republic of Santo Domingo, situated on the south coast, at the mouth of the Ozama (Map: West Indies, E 3). The city is regularly built, but its streets are unpaved. It is still surrounded by picturesque walls and contains interesting remains from former times, such as the ruins of large and well-built stone mansions, contrasting strangely with the present straw-thatched dwellings. There is a large Gothic cathedral, which was the resting place of the bones of Columbus until 1796, when what was believed to be the body of the discoverer was transferred to Havana, though the Dominicans claim that it still rests in their cathedral. A large statue of Columbus stands in the principal square. Other buildings and institutions worthy of mention are a former Jesuit college, a normal school, two hospitals, an arsenal, and barracks. The district is fertile. The city exports much sugar and coffee. Its harbor, however, is an open and dangerous roadstead, and the river is accessible only to very small vessels. Pop. (est.), 25,000. Santo Domingo is the oldest European settlement in America, having been founded by Bartholomew Columbus in 1496.

SANTO DOMINGO. See KERESAN STOCK.

SANTONES, săn'tō-nēz. The name of a tribe in ancient Gaul. Their chief city was on the site of the modern Saintes (q.v.).

SAN'TONIN (from *santon-ic*, from Lat. *Santonicus*, relating to the Santoni, from *Santoni*, a people of Aquitania; especially the *Santonicum absinthium*, Santonic wormwood, also called *Santonica herba*, Santonic herb, which abounded in Aquitania), $C_{15}H_{18}O_3$, and LEVANT WORMSEED. A neutral vegetable principle obtained from *santonica*, the unexpanded flower heads of *Artemisia pauciflora*, a perennial plant of the order Compositæ, growing in Persia and Asia Minor. Santonin is colorless, odorless, crystalline, practically insoluble in water. It is one of the most efficacious of the class of medicines known as anthelmintics or vermicides for roundworms. Two peculiar symptoms occur after the administration of santonin. The urine, if alkaline, often acquires a reddish tint, which may give rise to an unfounded suspicion of the presence of blood in that fluid; if acid, it is saffron-colored; and under its influence vision becomes remarkably affected for some hours, every object having a yellow tint (xanthopsy). This change may come on suddenly. It passes off, leaving no ill effects.

SANTORIN, săn'tō-rēn', or SANTORINI, săn'tō-rē'nē, i.e., *Saint Irene* (Anc. *Thera;* MGk. *Thira*). An island in the Ægean Sea belonging to the Greek nomarchy of the Cyclades (Map: Greece, G 7). It is situated 30 miles south of Naxos and 120 miles east of the southeastern extremity of the Morea and has an area of about 27 square miles. It is crescent-shaped, forming with two smaller islands, Therasia and Aspronisi, the edge of an ancient crater now occupied by a circular sheet of water into which the coasts fall precipitously to a great depth. The island consists chiefly of volcanic material, but its highest point (1916 feet), the limestone peak Hagios Ilias, i.e., St. Elias, existed before the volcano. Within historical times several new volcanic islets have risen from the surrounding water, the last in 1866. The island is treeless and poorly watered, but good wine is produced. Wine and Santorin earth, a kind of puzzuolana, are exported. Pop., 1889, 11,924; 1907, 19,597. The chief town is Thira. The island, under the name of Thera, was an important commercial state in ancient times and the mother country of the powerful colony of Cyrene in Africa. Remains of prehistoric dwellings have been found in Therasia and southern Santorin, buried in part under an early eruption, of which the date cannot be determined with certainty. Mycenæan remains have also been found. The early inscriptions preserve a very primitive form of the Greek alphabet, containing only 20 of the 22 letters of the Semitic alphabet and lacking the supplementary signs, though these were added under Ionian influence. Not only are the remains on the island important for the prehistoric civilization of the Ægean, but the excavation of the ancient city of Thera on the southeast coast has thrown much interesting light on the local history and life of a Greek island, especially during the Hellenistic and Roman periods. Consult: Hiller von Gaertringen and others, *Thera, Untersuchungen, Vermessungen und Ausgrabungen in den Jahren 1895–1898*, vols. i, iv (Berlin, 1899, 1902). The inscriptions are published in *Inscriptiones Græcæ Insularum Maris Ægæi*, fasc. iii (ib., 1898).

SANTORINI, săn'tō-rē'nē, GIOVANNI DOMENICO (1681–1737). An Italian anatomist, born in Florence and educated there by the Jesuits. He studied medicine in Pisa, under Malpighi, and then practiced in Florence, where he was professor of anatomy. His medical writings, especially those on anatomy and obstetrics, were long in high repute. Among his anatomical discoveries are the emissary veins leading out of the sinuses of the skull, the tubercles of cartilaginous knobs of the larynx, the risory muscles, and the gaps or fissures in the external ear.

SANTOS, săn'tōs. A seaport of Brazil, in the State of São Paulo, on the Atlantic coast, 200 miles southwest of Rio de Janeiro (Map: America, South, E 5). It is a handsome city, with well paved and shaded streets and fine public gardens. Formerly it suffered from epidemics of yellow fever, but improved sanitary measures and drainage works have practically exterminated this disease. The harbor has been made accessible to the largest vessels. It is the leading port of Brazil and had in 1913 imports amounting to 273,103,188 milreis, and exports,

490,279,306 milreis (1 milreis = 32.4 cents). It is the greatest coffee-exporting port in the world, being the outlet for the great coffee-producing State of São Paulo. In 1912 it exported 8,934,719 sacks of coffee, valued at $169,489,976. A large number of immigrants pass through this port. Pop., 1914, 90,000.

SANTOS-DUMONT, sän'tôs-dụ'môn', ALBERTO (1873–). A French aëronaut and designer of dirigible balloons. He was born in São Paulo, Brazil. From an early age he was interested in mechanics and engineering, and especially in the literature of aëronautics, but it was not until 1897 that he attempted his first ascent at Paris, which he had made his residence. Soon afterward he constructed a spherical balloon in which new and original ideas were embodied, and in 1898 he successfully applied a gasoline engine and propeller to an elongated balloon. For an account of his experiments and achievements, see AËRONAUTICS, *Airships of Santos-Dumont*. He became a Chevalier of the Legion of Honor in 1904 and received the Officer's Cross in 1909. Consult his autobiographical *My Airships* (New York, 1904).

SANTO TOMÁS, tô-mäs'. A town of Central Luzon, Philippines, in the Province of Batangas, situated 25 miles north of Batangas, on the main road and projected railroad between that city and Manila. Pop., 1903, 9488.

SANUDO, sä-nōō'dô, MARIN (MARINO SANUTO IL VECCHIO) (1260?–1338). A Venetian traveler and geographer. Like Marco Polo, Verrazano, and the Cabots, Sanudo was one of the scouts of Venetian commerce, but one who typically idealized his mission as in behalf of the Christian Church. His *Liber Secretorum Fidelium Crucis super Terrae Sanctae Recuperatione* (Hanover, 1611; Eng. trans. by Stewart, London, 1896) was ostensibly a guidebook for crusading armies and as such was dedicated to the Pope. It contains precise information as to the geography, populations, wealth, physiography, and trade routes of the mediæval Near East. The work is illustrated by the maps of Piero Visconti.

SANUDO, MARIN (MARINO SANUTO IL GIOVANE) (1466–1535). A Venetian statesman and chronicler, author of the *Diaries*. This gigantic record, published (Venice, 1872–1902) in 58 volumes, covers the years 1496–1533, and because of its range—from the simplest details of private life to the great questions of state, letters, and arts—it constitutes one of the most remarkable single sources of historical information in existence. The language is an Italianized Venetian dialect curiously deformed by Latinisms. Unsystematic by nature, the *Diaries* probably owed their birth to Sanudo's desire to become historiographer of the Republic, an honor which slipped from him first to Sabellico and then to Bembo. They contained originally parts more coördinately developed. Such are the *Lives of the Doges* (ed. by Monticolo, *Città di Castello*, 1900–13), the *De adventu Caroli regis Francorum*, and the account of a journey on the mainland. Sanudo was a patrician and early entered actively into the affairs of the *Maggior Consiglio* and Senate. What he heard and saw is not only authoritative, but important internationally, because of the great prestige of the Republic in political affairs at this period. Consult G. de Leva, *M. Sanudo il giovane e le opere sue* (Venice, 1888), and the preface to the *Diari* (Venice, 1903).

SANUTO. See SANUDO.

SAN VICENTE, sän vê-sän'tå. A town of the Republic of Salvador, on the right bank of the Acahuapa River, 32 miles east of San Salvador (Map: Central America, C 4). It manufactures *rebosos*, silk shawls, cotton goods, sugar, shoes, hats, salt, spirits, and cigars. Pop. (est.), 20,448.

SANZIO, sän'tsê-ô, RAPHAEL. See RAPHAEL.

SÃO CARLOS DE CAMPINAS, soun kär'lôs då kàm-pē'nàs. See CAMPINAS.

SÃO FRANCISCO, frän-sês'kô. The chief river of eastern Brazil (Map: Brazil, J 6). It rises on the Serra da Canastra in the southern part of the State of Minas Geraes and flows northeast through that state and the State of Bahía, then eastward on the boundary between Bahía and Pernambuco, and finally southeast between Alagoas and Sergipe, emptying into the Atlantic Ocean 200 miles southwest of Pernambuco. Its total length is about 1800 miles. The greater part of its course lies on the semiarid plains of the Brazilian plateau. In its extreme upper course it is torrential, descending from the mountains in a series of rapids as far as the confluence with the Rio das Velhas, where it becomes navigable for large vessels. For the next 1000 miles of its course it is broad, deep, and navigable until it begins the descent of the escarpment, about 200 miles from the sea. Here it is completely obstructed by a series of rapids which end in the magnificent Falls of Paulo Affonso, where the river, narrowed to a width of 60 feet, plunges over a rocky ledge in three leaps with a total height of 265 feet. Below the falls, which have been called the Niagara of Brazil, the river flows through a deep cañon, and only for the last 135 miles of its course is it navigable for seagoing vessels. It enters the ocean by two mouths, both of which are partly obstructed by bars, though they admit vessels of 15 feet draft at high water. A railroad has been built around the falls, and another connects Bahía with Joazeiro on the upper course of the river, which is regularly navigated by inland steamers. The tributaries are all comparatively short, though several are navigable.

SÃO JOÃO D'EL REI, zhô-ouN' dĕl rā'ê. A town of the State of Minas Geraes, Brazil, 66 miles southwest of Ouro Preto, on the right bank of the river Mortes. It is an important commercial centre, with railroad connection with Sabará and Rio de Janeiro. It has cotton mills and tanneries. Cattle raising also is carried on. Pop. (est.), 15,000. The town was founded in 1670 and was formerly celebrated for its gold and diamond mines.

SÃO LEOPOLDO, lā'ô-pôl'dô. A town of the State of Rio Grande do Sul, Brazil, on a branch of the Jacuhy, 20 miles north of the capital, Porto Alegre (Map: America, South, D 5). The town is in a rich agricultural region, peopled almost wholly by Germans, many of whom are descendants of the first German colony of Brazil, established here in 1824. Pop. (est.), 7500.

SÃO LUIZ DE MARANHÃO, lōō-ēsh' då mä'rà-nyouN'. A city of Brazil. See MARANHÃO.

SAÔNE, sōn (ancient *Arar*). A river of France, the most important affluent of the Rhone (Map: France, N., K 6). It rises in the Department of Vosges and flows past Gray, Chalon, and Mâcon to its confluence with the Rhone at Lyons. It is 300 miles long and has been made navigable to Corre, 232 miles for

vessels up to 6½ feet. Canals connect it with the Loire, the Seine, the Meuse, the Moselle, and the Rhine. The chief affluents are the Doubs and Ognon. Consult P. G. Hamerton, *The Saône* (London, 1887).

SAÔNE, HAUTE. A department of France. See HAUTE-SAÔNE.

SAÔNE-ET-LOIRE, -å-lwär. A department of southeast France (Map: France, N., K 6). Area, 3331 square miles; pop., 1911, 604,446. The country consists for the most part of fertile plains, watered by the rivers which give their names to the department and separated by rich vine-clad hills. The most important cereals are wheat and oats. Coal is mined extensively, and there are important iron manufactures. Capital, Mâcon.

SÃO PAULO, soun poũ'lô. A state of southeast Brazil (Map: America, South, E 4). Area, 112,307 square miles. The narrow strip of low coast land is succeeded by a mountain chain running parallel to the coast. The country west of the mountains is an elevated plateau, traversed by numerous river valleys. The western portion, adjoining the Paraná River, is little known and inhabited only by roving Indians. The chief rivers of the state are the Pardo, Tiété, and the Aguapehy, all of them tributaries of the Paraná and partly navigable. The climate is generally moderate and healthful, and only the coast is excessively hot, while frost occurs on the plateau. The soil is of great fertility and is so well adapted for the cultivation of coffee that São Paulo has become the chief coffee-producing state of Brazil. Rice, tobacco, and sugar cane are produced in the coast land, and stock raising is carried on extensively in the interior. The chief manufactured products are cotton goods, hats, cigars and tobacco, and some iron products. Commercially São Paulo occupies a very prominent position. In 1911 its exports amounted to $154,689,500, or 47 per cent of the total exports of Brazil, of which coffee formed over 90 per cent. The commerce and manufactures are largely in German hands. The state has an extensive system of railways (3387 miles in 1912), which connect the capital, São Paulo, with the chief seaport, Santos, as well as with Rio de Janeiro and the railway lines of Minas Geraes. Pop., 1900, 2,282,279; 1912 (est.), 2,800,000, including a large European element.

SÃO PAULO. The capital of the State of São Paulo, Brazil, and the second largest city of the Republic. It is situated 210 miles southwest of Rio de Janeiro, on a plateau having a mild and healthful climate, and separated from its port, Santos, 25 miles distant, by the Serra do Mar (Map: America, South, E 4). It has a modern appearance, with long, busy streets, traversed by street railroads, lighted by electricity, and lined with fine shops and warehouses. The most notable buildings are the cathedral, the government building (which is an old Jesuit college, dating almost from the foundation of the city), the episcopal palace, the treasury, and the magnificent Ypiranga Palace, erected to commemorate the Declaration of Independence. There are also a large and well-equipped hospital and a celebrated law school. São Paulo is the industrial centre of the state, the principal manufactures being articles of consumption. It also has a large trade and is the centre of the state railroad system. Its growth during the last two decades has been exceedingly rapid and is largely due to German and Italian immigration. It is the residence of a United States consular agent. Pop., 1914 (est.), 475,000. São Paulo was founded by the Jesuits in 1554 as a mission station.

SÃO ROQUE, rō'kå, CAPE. See CAPE SAN ROQUE.

SÃO SALVADOR, säl'vå-dōr'. A city of Brazil, the capital of the State of Bahía. See BAHÍA.

SAOSHYANT, sou'shyànt (Av. *saošyant*, he who is to save, fut. p. of *sū*, Skt. *śū*, to swell, prosper). The Iranian Messiah. In the earlier parts of the Avesta the term is frequently used in the plural to denote those who by their sanctity and zeal further the cause of Zoroastrianism. In its more usual sense, however, the Saoshyant is the last and greatest of the three millennial prophets, who is to usher in the day of judgment. This religious concept is not definitely mentioned in the oldest portions of the Avesta (q.v.), the Gathas (q.v.); but in the later Avesta, especially in the nineteenth yasht, the idea is developed, while the Pahlavi texts (see PAHLAVI LANGUAGE AND LITERATURE) give the doctrine in full detail. According to Parsi mythology Zoroaster (q.v.) thrice approached his third wife, Hvovi, but without union. The seed is preserved in the Lake of Kansava, and at the end of 9000 out of the 12,000 years which elapse between the creation and the day of judgment, a virgin bathes in this lake, conceives, and bears the first of the millennial prophets, Ukhshatereta, or Aushetar. After another 1000 years a second virgin in like manner bears Ukhshat-nemah, or Aushetar-mah, and when this millennium expires Astvat-ereta, the great Saoshyant, is born. During these 3000 years the world continually grows better, so that even in the time of Ukhshat-nemah but one-third of mankind is evil, while human food consists only of vegetables and milk and is taken but once in three days. With the advent of Astvat-ereta preparations for the resurrection of the dead begin, commencing with the first man, Gayomart, and the primal pair, Mashya and Mashyoi. This takes 57 years, during which the Saoshyant is assisted by 15 men and 15 maidens. After the judgment Astvat-ereta, with his helpers, performs a sacrifice of the ox Hadhayos, or Sarsaok, and the white Hom plant. (See SOMA.) From these offerings a mystic drink is prepared which gives immortality to all. After this the Saoshyant, together with his helpers, gives, at the command of Ormazd (q.v.), recompense to all according to their deeds.

The origin of the Saoshyant concept is uncertain. One is naturally inclined to derive it from Babylonia, whence certain Iranian ideas were borrowed. Of this, however, there is little evidence, for Marduk, who, like Ninib and Gula, is called the "restorer of the dead to life" and who triumphs over Tiamat in the cosmic battle which is transferred in Zoroastrianism as in Judaism from the beginning to the end of the world, is scarcely an analogue. (See ESCHATOLOGY.) Neither do the religions of India afford any parallel to Astvat-ereta. The analogy of the Zoroastrian with the Judæo-Christian Messiah idea is striking, especially in the teaching of the apocryphal books, as the apocalypses of

Ezra, Paul, and John, and of the Gospel of Nicodemus (cf. also Rev. xi. 3), that Enoch and Elijah, or Moses and Elijah (cf. also Matt. xvii. 3), are to precede the Messiah. On the other hand, it is quite probable that the Saoshyant and the Messiah were independent developments.

Bibliography. L. C. Cosartelli, *Philosophy of the Mazdayasnian Religion under the Sassanids* (Eng. trans. by Firaz, Bombay, 1889); A. V. W. Jackson, "Iranische Religion," in Geiger and Kuhn, *Grundriss der iranischen Philologie*, vol. ii (Strassburg, 1900–03); Nathan Söderblom, *La vie future d'après le mazdéisme* (Paris, 1901); Ernst Böklen, *Verwandtschaft der jüdisch-christlichen mit der parsischen Eschatologie* (Göttingen, 1902); L. Guy, *Le millénarisme dans ses origines et son développement* (Paris, 1904); L. H. Mills, *Avesta Eschatology* (Chicago, 1908).

SÃO THOMÉ, soun tô-mā′, or SAINT THOMAS. An island belonging to Portugal and situated off the west coast of Africa in the Gulf of Guinea, 270 miles south of the mouth of the Niger (Map: Africa, E 4). Area, 358 square miles. It is volcanic and mountainous, being more than 7000 feet high. The rainfall is abundant, and nearly the whole island is covered with luxuriant forests. The chief products are cacao, coffee, rubber, and cinchona. In 1913 the imports (including Principe Island) amounted to $1,669,500, and the exports to $7,841,000. The capital, Cidade de São Thomé, is the residence of the Governor, whose jurisdiction extends also over the neighboring Principe Island. Pop., 1900, 37,776; 1909, 68,221.

SAP (AS. *sæp*, OHG. *saf*, Ger. *Saft*, sap; probably from Lat. *sapa*, must). The popular name for the watery solutions found in plants and without exact scientific significance. It is properly applied only to the juices, though sometimes used to designate the slimy protoplasm which escapes from the delicate layers of cells lying between the bark and the wood in shrubs or trees. See CONDUCTION.

SAP (OF. *sappe*, Fr. *sap*, hoe, mattock, from ML. *sappa, sapa*, hoe, mattock, probably from Gk. *σκαπάνη, skapanē*, hoe, from *σκάπτειν, skaptein*, to dig). A military term denoting a narrow trench, subsequently widened, which is continually prolonged in the desired direction by digging away the earth at its head and utilizing the same as a cover for the working party. A single or full sap is a trench with the parapet constructed at the head and on its exposed flank. A double sap is so called when both flanks and the head of the sap are exposed to fire; two full saps are driven parallel and very near to each other, each with its parapet on the outer flank. The double sap is formed by removing the strip of earth dividing the two narrow trenches, the result being a single wide trench or sap with a parapet on each side. Running a sap has always been a difficult as well as dangerous operation, owing to the command of fire possessed by the enemy, and soon came to be restricted to night operations. The modern searchlight and other electrical contrivances, however, make the hazard great also by night. The engineer soldiers detailed and trained for this work are known as sappers. See SIEGE AND SIEGE WORKS.

SAPAJOU, săp′ȧ-jōō, or **SAJOU,** sȧ-jōō′. A French rendering of an obscure native name in Brazil (see SAI), now applied to the typical American monkeys of the genus *Cebus*, of which many species are known. The group includes some of the largest of American monkeys as well as those which have the largest brain capacity and show the greatest intelligence. The monkeys which range the farthest north are also sapajous. One of the most noteworthy species is the white-fronted (*Cebus albifrons*), common in the forests at the headwaters of the Amazon and easily recognized by its light-brown color and white forehead. Like the tribe generally, they live in troops of 30 or more and are great jumpers, leaping, it is said, 40 or 50 feet from tree to tree when necessary. They are often made pets of, but are extremely jealous and are restless and irritable. One of the largest species is *Cebus olivaceus*, which is 44 inches long, 20 of which belong to the tail. The sapajous of the genus *Ateles* include the well-known coaitas, or spider monkeys (q.v.). Perhaps the best known of all is the weeper sapajous, or capuchin (*Cebus capucinus*), whose fur has a golden tinge and is short and even all over its head as though roached. See Plate of AMERICAN MONKEYS with the article MONKEY.

SAPAN (sȧ-păn′) **WOOD, SAPPAN WOOD** (Malay *sapang*), or BUKKUM WOOD. The wood of *Cæsalpina sappan*, an East Indian tree, about 40 feet high, with twice pinnate leaves, and racemes of yellow flowers, much used as a red dye, which is not easily fixed. A great deal of the sapan wood is exported from Singapore and other East Indian ports to Calcutta and to Europe.

SAP CHAFER. One of many species of cetonian beetles which have mouth parts formed for the sipping or lapping of vegetable juices rather than for boring or chewing. They feed indifferently upon the sap which exudes from wounds in trees or upon the juices of over-ripe or injured fruit or other succulent vegetable growth and upon pollen. One of the commonest species in the United States is the brown sap chafer (*Euphoria inda*), a rather large brown variegated beetle which appears abundantly in the autumn over a large part of the Western States. The eggs are laid in the spring beneath the surface of the ground, and the larvæ, which are white grubs closely resembling the larvæ of the May beetles (see JUNE BUG) and the figeater or June beetle (q.v.), feed upon decaying vegetable matter and soil humus.

BROWN SAP CHAFER.

SAPELNIKOV, sȧ-pĕl′nĭ-kôf, VASSELY (1868–). A Russian pianist, born at Odessa. He studied at the St. Petersburg Conservatory under Franz Kessler and Sophie Menter (q.v.), making his début as a concert pianist at Hamburg in 1888. In 1897–99 he was professor of piano playing at the Moscow Conservatory, then resigning to live in Germany. He made extensive concert tours of Europe. As a composer he won success with a number of dainty and piquant smaller pieces for piano. He also wrote an opera, *The Khan and his Son*.

SAPHIR, sä′fêr, MORITZ GOTTLIEB (1795–1858). An Austrian humorous writer, born at

Lovas-Berény, Hungary. He edited the Vienna *Humorist* from 1837 to 1858, and his humorous readings in that city were very popular. His numerous publications, such as the *Fliegendes Album für Ernst, Scherz, Humor und lebensfrohe Laune* (1846) and *Konversationslexikon für Geist, Witz und Humor* (2d ed., 1860), are now little read. They display chiefly a faculty for clever puns.

SAPHIRE D'EAU, sȧ′fēr′ dō (Fr., water sapphire), or DICHROITE. A gem variety of iolite. When cut it shows a very fine play of colors, presenting different shades of blue, bluish white, and yellowish gray, according to the directions in which the mineral is viewed. See IOLITE.

SAP'INDA'CEÆ (Neo-Lat. nom. pl., from *Sapindus*, from Lat. *sapo*, soap), THE SOAPBERRY FAMILY. A family of dicotyledonous trees, twining tendril-bearing shrubs, and a few herbaceous climbers. The family includes about 125 genera and over 1000 species, widely distributed in tropical and warm regions, and especially well represented in South America and India. The timber of some species is valuable; Guarana bread is made from the seeds of a species of this order; the leaves of another (*Cardiospermum halicacabum*) are used as a boiled vegetable in the Moluccas; and the fruits of some species are excellent. The family is represented in North America by *Sapindus* (soapberry) and the well-known *Æsculus* (buckeye, horse-chestnut). Some botanists regard buckeyes as a distinct family (Æsculaceæ). *Cardiospermum* (balloon vine), a climbing and extensively branching vine with compound leaves and inflated capsules, is common in cultivation. See AKEE.

SAPI-UTAN, sä′pē-o͞o′tan. The Malay name of the anoa (q.v.). For illustration, see Plate of BUFFALOES.

SAPO, sä′pō (Sp., large toad). A South American name for various toadfishes (q.v.), especially one of the genus *Porichthys*, or midshipmen, a species (*Porichthys notatus*) very abundant along the California coast. It lives under stones near the shore and is locally known as the singing fish on account of a peculiar humming noise made with its air bladder. It is about 15 inches long, olive brown with coppery reflections, the sides marked with broad bars, and the pores of the lateral line beadlike and shining.

SAP'ODIL'LA (Sp. *sapotilla*, dim. of *Sapota, zapote*, from Aztec *zapotl*, sapota tree), *Achras sapota*. A tree of the family Sapotaceæ (q.v.). The fruit has a subacid pulp which is highly esteemed for dessert in the West Indies, where the tree is native and whence it has been introduced into many other tropical countries. It is generally called naseberry in the British West Indies. See CHEWING GUM.

SAPODILLA PLUM. See BLACK BULLY.

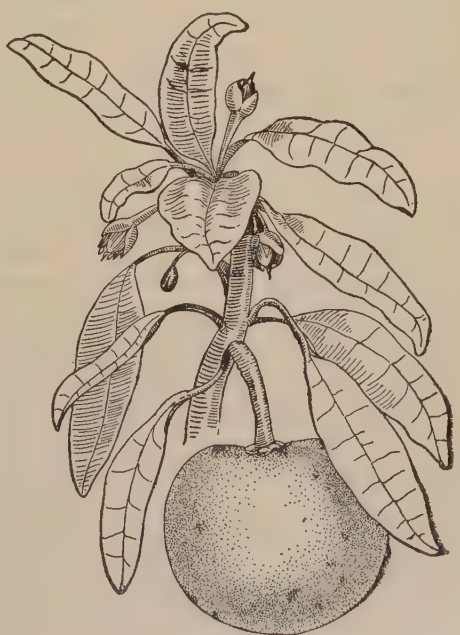
SAPONI, sȧ-pō′nē. A Virginia tribe of Siouan stock (q.v.), known in history as the confederates of the kindred Tutelo, both tribes being now extinct. The Saponi are first mentioned in 1670 by the German traveler John Lederer, who visited their town on what appears to have been Otter Creek, southwest of Lynchburg. Besides Lederer's early notes we have some valuable ethnologic information concerning the Saponi from William Byrd (q.v.), in charge of the Virginia boundary survey of 1728, who visited their town and had one of their men in his service as guide and hunter. They still made fire by rubbing two dry sticks together, and new fire was always made for each ceremonial occasion. They made spoons from buffalo horn, and their women wove baskets and dress fabrics from the fibre of silk grass. They had horses, but were awkward riders. They had strict regard to religious taboos. See also OCCANEECHI; TUTELO.

SAPON'IFICA'TION. See ESTERS; FATS; OIL; SOAP.

SAP'ONINS (from Lat. *sapo*, soap), $C_nH_{2n-8}O_{10}$. Glucosides contained in various plants, including the *Saponario officinalis*, or soapwort, the *Polygala senega*, or snakeroot, the fruit of the horse-chestnut, etc. The saponin is readily extracted from the root of soapwort by means of boiling alcohol, which, as it cools, deposits the compound as an amorphous sediment. The name is taken from its behavior with water, with which it forms an opalescent fluid that froths when shaken, like a solution of soap, if even $\frac{1}{1000}$ part of the saponin be present. This property of emulsification is the sole reason for the use of these bodies. Soapbark or soapwort is used in cleansing articles which would be injured by contact with soap. As a rule the bark is that of a Chilean tree, *Quillaja saponaria*.

SAP'ONITE. See ROCK SOAP.

SAPORTA, sȧ′pôr′tȧ′, GASTON, MARQUIS DE (1823–95). A French botanist and paleontologist, born at Saint-Zacharie (Var). He served in the army, then devoted himself to paleobotany, and in 1876 became a corresponding member of the French Academy of Sciences. Besides many contributions to periodicals, of which part were on the climate of geological periods, he wrote: *Algues, equisétacées, characées, fougères* (1873); *Le monde des plantes avant l'apparition de l'homme* (1878); *L'Evolution du règne végétal* (1881–85), with Marion; *A propos des algues fossiles* (1883); *Les organ-*



SAPODILLA (*Achras sapota*).

ismes problématiques des anciennes mers (1885); *Origine paléontologique des arbres cultivés* (1888); *Derniers adjonctions à la flore fossile d'Aix-en-Provence* (1889); and a genealogical study, *La famille de Mme. de Sévigné en Provence* (1889).

SAP'OTA'CEÆ (Neo-Lat. nom. pl., from *Sapota*, from Sp. *sapota, zapote*, sapota tree), The Sapodilla Family. A family of dicotyledonous trees and shrubs, often abounding in milky juice, which in many species yields gutta-percha. About 35 genera and 425 species are known, mostly of tropical regions. The fruits of some are pleasant, as the sapodilla. The genus *Bassia* contains species valuable for the oils which they yield. The seeds of *Mimusops* also yield oil abundantly. Several genera include species which yield gutta-percha, some of them at one time being almost the only sources of that product. See Gutta-Percha.

SAPPAN WOOD. See Sapan Wood.

SAP'PARE. See Cyanite.

SAPPHIRE, săf'ĭr (OF., Fr. *saphir*, from Lat. *sapphirus*, from Gk. *σάπφειρος*, sappheiros, sapphire, or perhaps lapis lazuli, from Heb. *sappīr*, sapphire). A blue variety of corundum (q.v.), highly prized as a gem. It is similar in composition to the ruby, but it is somewhat harder and of slightly higher specific gravity. It crystallizes in the hexagonal system, usually in the form of double pyramids. The sapphire has a beautiful blue color, although spotted varieties are not rare, the yellow, white, and blue spots being sometimes sharply separated or again grading into each other. Heating the stone drives the blue color away permanently. The value of the gem increases with the depth of the color up to the limit of translucency, the most prized specimens having a cornflower-blue tint. Asteria is the name applied to an imperfectly transparent variety which, when cut in the form of a dome, shows six starlike rays. Sapphires of good color and size are more common than rubies and much cheaper. A specimen of good color, weighing two or three carats, has about the same value as a diamond of equal size. Some very large sapphires have been found; one of 951 carats was recorded in 1827 as being in the possession of the King of Ava. Other large stones are in the museum of the Jardin des Plantes, Paris. Sapphires occur in very much the same regions as the ruby, and indeed the two are often found together. The best sapphires come from Siam, where they are mined in the loose surface deposits which yield the ruby. They are also found in Burma, Ceylon, and Kashmir and at many localities in Australia. The Australian sapphires are not regarded with much favor, owing to their dark color. In the United States the most valuable stones are obtained in North Carolina and Montana. In the former State they are found in gravel deposits, from which they are separated by a washing process. The Montana deposits, the most important discovered in recent years, occur as bars on the upper Missouri River and also in an igneous dike which can be traced for several miles. The stones are obtained chiefly from the decomposed portion of the dike and are separated from the matrix by washing. They range in weight from less than one carat up to four or five carats. The production of sapphires in the United States in 1913 was valued at $238,635, almost the entire output coming from Montana.

Consult: Max Bauer, *Edelsteinkunde* (Leipzig, 1896); G. F. Kunz, *Gems and Precious Stones of North America* (New York, 1892); J. H. Pratt, "The Occurrence and Distribution of Corundum in the United States," in *United States Geological Survey Bulletin, No. 180* (Washington, 1901). See Corundum; Gems; Girasol.

SAPPHO, săf'ō. An opera by Massenet (q.v.), first produced in Paris, Nov. 27, 1897; in the United States, Nov. 17, 1909 (New York).

SAPPHO (Lat., from Gk. *Σαπφώ*). A Lesbian poetess of good family, a contemporary of Alcæus (c.600 B.C.) and with him the chief creator of the Æolian personal lyric. Sappho is for us chiefly a name, a theme for the fervent rhetoric evoked by impassioned contemplation of the few exquisite fragments of her poems that time has spared, a type of the highest achievement of woman in literature, a symbol and synonym of the intoxication of absolute lyric, "all fire and dew." She was born at Eresos, or, more probably, at Mitylene, where she lived until she was exiled by an uprising of the democratic party against the oligarchs. From her poems we infer that she practiced and taught her art in a coterie, club, or school of maidens, to whom she was devotedly attached, whom she addressed in the language of passionate adoration, and whose bridal odes she composed when they left her to marry. Familiar to all poets and lovers is the legend (unsupported) of her unrequited love for Phaon and of her casting herself down from the promontory known as Lover's Leap, or Sappho's Leap (q.v.), to that "Leucadian grave which hides too deep the supreme head of song" (Swinburne). Alcæus is said to have been her lover and to have addressed her in the words, "Violet-tressed, sweetly smiling, pure Sappho, fain would I speak, but shame forbids." To this the poetess replied, "If thy desire was of aught fair and good, shame had not beset thine eyes, but thou hadst spoken thereof frank and true."

The ancients read her poems in nine books. The extant fragments include (1) the ode to Aphrodite, 27 lines in Sapphic strophes quoted by the critic Dionysius of Halicarnassus as an example of the "smooth style"; (2) the "Blest as the immortal gods is he," to name it by Ambrose Philips's hopelessly inadequate translation, four Sapphic strophes cited by Longinus as a specimen of the sublime; and (3) some hundred or more single lines and stanzas in a great variety of lyric metres. They may be found in Bergk's *Poetæ Lyrici*, vol. iii (new ed., Leipzig, 1914), in the Teubner *Anthologia Lyrica*, and, with English translations added, in Wharton's *Sappho* (3d ed., Chicago, 1895). Some additional fragments have recently been recovered from Egyptian papyri; for these consult J. M. Edmonds, in the *Classical Review*, xxii (London, 1909), xxviii, 73 ff. (1914), and in the *Classical Quarterly*, iii (ib., 1909), and A. S. Hunt in "The Year's Work" in *Classical Studies*, vol. ix, p. 39 (London, 1915). The chief motives of Sappho's poems are love and the beauty of nature. They contain no profound thoughts and few striking images, but are marked by exquisite beauty of diction and liquid lapse of rhythm. Swinburne, in his poem "On the Cliffs," has in the following manner reproduced the impression of one wistful waif of verse:

I loved thee,—hark, one tenderer note than all—
Aithis, of old time, once—one low, long fall,
Sighing—one long, low, lovely, loveless call,
Dying—one pause in song so flamelike fast—
Aithis, long since in old time overpast—
One soft first pause and last.
One,—then the old rage of rapture's fieriest rain
Storms all the music-maddened night again.

Bibliography. G. S. Farnell, *Greek Lyric Poetry* (London, 1891); H. W. Smyth, *Greek Melic Poets* (ib., 1900); P. Brandt, *Sappho* (Leipzig, 1905); B. Steiner, *Sappho* (1907); W. C. Wright, *A Short History of Greek Literature* (New York, 1907); Christ-Schmid, *Geschichte der griechischen Litteratus*, vol i, part i (6th ed., Munich, 1912); Ulrich von Wilamowitz-Moellendorf, *Sappho und Simonides* (1913).

SAPPHO'S LEAP. The high cliff anciently called Leucadia or Leucas, now Cape Ducato, at the southwest corner of Santa Maura (q.v.), one of the Ionian Islands. From it Sappho (q.v.) the poetess is said to have thrown herself into the sea on account of her hopeless love for Phaon.

SAPPING AND MINING. See MINES AND MINING, MILITARY; SAP.

SAPPORO, säp'pō-rō. The capital of the island of Yezo, Japan, situated on the Ishikari River, a short distance from the west coast (Map: Japan, G 2). It has an agricultural college, a museum with specimens of the work of aborigines, and a botanical garden. The manufacturing establishments include saw, flour, and sugar mills and a flax factory. Sapporo owes its importance to its connection with the colonization of Yezo, since 1870. Pop., 1898, 37,482; 1908, 70,084.

SAP'ROLEG'NIA (Neo-Lat., from Gk. *σαπρός, sapros*, rotten + λέγνον, *legnon*, edge, border). The best-known genus of water molds (see PHYCOMYCETES), commonly found as saprophytes on dead bodies of crustaceans, water insects, etc., and as parasites attacking fishes, frogs, etc. One species that attacks the eggs and young of fishes is very destructive in hatcheries. The genus is notable also for the frequent occurrence of parthenogenesis (q.v.).

SAP'ROPHYTE (from Gk. *σαπρός, sapros*, rotten + *φυτόν, phyton*, plant). A plant which contains no chlorophyll and which derives its nourishment from dead organic matter. Saprophytes are among the active agents which rid the earth of the remains of animals and plants which would otherwise accumulate. Among flowering plants there are some symbiotic saprophytes, such as Indian pipe (*Monotropa*) and certain orchids (as *Corallorhiza*). These grow in rich humus, the underground portions generally associated with a fungous mycelium. (See MYCORRHIZA.) Among the ferns and their allies the saprophytic habit has also been developed to some extent; but saprophytism is best illustrated among the fungi, where entire groups exhibit this mode of life. See SYMBIOSIS.

SAPROPHYTE. A division of bacteria (q.v.).

SAP'SUCK'ER. Any of various American woodpeckers alleged to suck the sap of trees; properly the yellow-bellied woodpecker (*Sphyrapicus varius*), which breeds in Canada and migrates through the United States in spring and autumn. It is of medium size, black above with white markings and a white rump; forehead, crown, chin, and throat crimson in the male, less so in the female; breast with a broad black patch; belly pale sulphur yellow. These colors are highly variable. It has the habit of pecking squarish holes in great number in the spring in the bark of sweet-sapped trees, eating to some extent the new wood beneath and the sap and catching the insects attracted by the sweet exudation. Its breeding habits are similar to those of woodpeckers generally. Several other species of the genus are known in the West, that common on the Pacific coast (*Sphyrapicus ruber*) having the whole head, neck, and chest of the adults of both sexes red. See WOODPECKER; and consult authorities there cited.

SAPTARSHI, säp-tär'shĕ (Skt., the seven sages). A system of reckoning time in India, used especially in Kashmir. It is based on the theory that the seven Rishis (q.v.; the seven bright stars of Ursa Major) move through the zodiac in 2700 years, at the rate of one nakshatra, or twenty-seventh of the ecliptic, each century. In ordinary reckoning the hundreds are omitted. In calculation 47 must be added to the Saptarshi year to find the corresponding Saka (q.v.) year, and 24–25 to determine the Christian equivalent. Consult: Sewell and Dikshit, *The Indian Calendar* (London, 1896); R. Sewell, *Indian Chronography* (ib., 1912); L. D. Barnett, *Antiquities of India* (ib., 1913). See SAMVAT.

SAPUCAIA (säp'o͞o-kī'à) **NUT** (Brazilian name). The seed of *Lecythis ollaria*, a lofty Brazilian tree, of the family Lecythidaceæ. The urn-shaped fruit as large as a child's head, which opens by a deciduous lid, contains several oval seeds or nuts, as in the case of the allied Brazil nut (q.v.), which is inferior in flavor but is far more extensively exported. It is known also as paradise nut.

SAPULPA, sà-pŭl'pà. A city and the county seat of Creek Co., Okla., 102 miles northeast of Oklahoma City, on the St. Louis and San Francisco Railroad (Map: Oklahoma, E 3). It has railroad shops and yards, an enormous oil refinery, machine shops, glass plants, cotton gins and compresses, and manufactories of mattresses, candy, cigars, bricks, oil-well supplies, etc. Sapulpa contains the Euchee Indian Mission, with five fine buildings, and an excellent public-school system. Pop., 1900, 4259; 1910. 8283; 1915 (U. S. est.), 12,180; 1920, 11,634.

SAQQARA, sàk-kä'rà, or **SAKKARA.** An Egyptian village on the left bank of the Nile, in lat. 29° 52′ N., situated on the edge of the Libyan Desert, about 3 miles from the river. It stands in the midst of the ancient necropolis of Memphis (q.v.), and around it are some of the most interesting monuments in Egypt. Saqqara means, in Arabic, "hawk's nest," but the word is probably a corruption of the old Egyptian name containing the name of Sokar, the Memphitic god of the dead. In the immediate vicinity of the village and to the west of it are the pyramids of Pepi I and his son Mer-en-Rê, of the sixth dynasty; that of Pepi II, another son of Pepi I, lies a little farther south. To the north are the pyramids of Teti, the founder of the sixth dynasty, and of Unas, the last King of the fifth dynasty. All these pyramids were opened in 1881, and the walls of their sepulchral chambers were found to be covered with long inscriptions of a religious character. Between the pyramids of Unas and Teti lies the great step pyramid of Saqqara,

which has been attributed to King Zoser, and, if this be true, it is undoubtedly the oldest pyramid in existence. It consists of six stages, is about 190 feet in height, and contains numerous corridors and chambers. Near it are the subterranean tombs of the Apis bulls and the remains of the Serapeum (q.v.). In this vicinity are the tombs of a number of nobles of the fifth and sixth dynasties. They are of great architectural interest, and their inner walls are covered with reliefs and paintings giving vivid illustrations of Egyptian life and customs under the Old Empire. Consult: K. R. Lepsius, *Denkmäler aus Aegypten und Aethiopien* (Berlin, 1850–59); W. M. Flinders Petrie, *A History of Egypt*, vol. i (New York, 1895); E. A. T. Wallis Budge, *A History of Egypt* (London, 1902).

SARA, sä'rȧ. A town of Panay, Philippine Islands, in the Province of Iloilo, situated 2 miles northwest of Concepción (Map: Philippine Islands, D 5). Pop., 1903, 11,366.

SARA. See Moonja.

SAR'ABANDE (Fr. *sarabande*, from Sp. *zarabanda*, probably from Pers. *sarband*, fillet, from *sar*, head + *band*, bond). Originally a slow dance said to be of Saracenic origin; and hence a short piece of music, of deliberate character and with a peculiar rhythm, in three-quarter time, the accent being placed on the second quarter of each measure. The sarabande forms an essential part of the suites written by Handel, Sebastian Bach, and others of the old masters, for the harpsichord or clavichord. All extra movements were inserted after the sarabande. The dance became popular in Europe in the sixteenth century, but it was bitterly attacked by Cervantes and other Spanish writers for its indecency, and Philip II suppressed it for a time. A modified form of it, however, was introduced in France, and in England it became a popular country dance.

SAR'ACENS (OF. *sarracen, sarracin, sarrazen*, Fr. *sarrasin*, from Lat. *Saraceni*, from Gk. Σαρακηνός, *Sarakēnos*, Saracen, from Ar. *šarqīn*, pl. of *šarqiy*, from *šarq*, rising sun, from *šaraqa*, to rise). A name variously employed by mediæval writers, to designate the Mohammedans of Syria and Palestine, the Arabs generally, or the Arab-Berber races of northern Africa, who conquered Spain and Sicily and invaded France. At a later date it was employed as a synonym for infidel nations against whom crusades were preached and was thus applied to the Seljuks of Iconium, the Turks, and others. The name appeared as early as the first century of the Christian era, when it was applied by Greek writers to some Arab tribes of the Syrian Desert, of northwestern Arabia, and of the Desert of Tih. In the hundred years following the Hejira (622 A.D.) a Saracen empire was established which extended from Turkestan to the shores of the Atlantic. Mohammed made himself master of Mecca in 629, and the first caliphs, Abu-Bekr and Omar, between 632 and 641, conquered Syria, Palestine, Persia, and Egypt. By 709 the Saracens had extended their sway over northern Africa to beyond the Strait of Gibraltar. They then crossed over to Spain (711), nearly the whole of which they subjugated. From Spain they poured into Gaul, where their progress was arrested by Charles Martel, near Poitiers, in 732. Sicily was conquered by them between 827 and 878, and early in the tenth century they extended their incursions far into the Burgundian territories. The disruption of the great Saracen realm began about the middle of the eighth century, when the western portion tore itself away from the rest, becoming a separate state, with Cordova as its capital. Consult: Simon Ockley, *The Saracens* (London, 1847); E. A. Freeman, *The Saracens* (ib., 1876); Ameer Ali, *Short History of the Saracens* (ib., 1900). See Arabia; Abbasides; Caliph; Crusade; Ommiads.

SARAGOSSA, sä'rȧ-gŏs'sȧ (Sp. *Zaragoza*). The capital of the Province of Saragossa, Spain, and formerly of the Kingdom of Aragon, situated on the right bank of the Ebro, 110 miles in a straight line from its mouth, and 212 miles by rail northeast of Madrid (Map: Spain, E 2). It stands in the midst of a desert plain, but is immediately surrounded by a well-irrigated and fertile *huerta*. Two bridges cross the Ebro to the northern suburb—one a handsome stone bridge of seven arches, the other a railroad bridge. The central nucleus of the town still retains its old aspect, with narrow winding lanes, lined with old houses of solid construction and often richly decorated, many of them being the former palaces of nobles, but now generally in a dilapidated condition. The surrounding portions of the town are modern and regularly built, with broad streets and shaded boulevards. The most prominent buildings of the city are its two cathedrals, the old Gothic cathedral of La Seo, built between 1119 and 1520, and that of Nuestra Señora del Pilar, begun in 1681. The latter contains the sacred pillar on which the Holy Virgin is believed to have appeared to St. James. Other notable buildings are the church of San Pablo, in the Transition style of the thirteenth century; the Gothic church of Engracia, partly destroyed during the siege of 1808; the Castillo de la Aljafería, built by the Moors and later used as the royal residence of Aragon; the Audiencia, formerly the palace of the counts Luna; and the Lonja, or Exchange, a handsome and richly decorated Renaissance building. Saragossa has a university founded in 1474, a veterinary school, a superior normal school, schools of music and fine arts, as well as of commerce and trade, and a botanical garden. The city is an important railroad centre, and its commerce and manufactures are thriving. It has iron foundries, machine shops, flour and paper mills, breweries, and manufactures of chocolate, preserves, glass, chemicals, soap, and candles. Pop., 1900, 98,125; 1910, 111,704.

Saragossa is on the site of the ancient Iberian *Salduba*. Its strategic importance was recognized by the Romans, who made it a military colony under the name of *Cæsarea Augusta*, from which its Spanish name is a corruption. It was in the possession of the Moors from 712 to 1118, when it was taken by Alfonso I after a long siege. Saragossa is especially famous for the heroism with which the citizens, led by Palafox (q.v.), defended it against a large French army in 1808–09. The French finally captured the city after a hard-fought contest in which they suffered great losses.

SARAGOSSA, Duke de. See Palafox y Melzi, José de.

SARAGOSSA, Maid of. See Agustina.

SARAJEVO, sä'rȧ-yȧ-vō. See Serajevo.

SAR'ANAC LAKE. A village in Franklin Co., N. Y., 132 miles northeast of Utica, in one of the most picturesque parts of the Adi-

rondack Mountains, near the head of the Lower Saranac Lake, and on the New York Central and the Delaware and Hudson railroads (Map: New York, F 2). It is a noted pleasure and health resort and the business centre of the Adirondack region. Near by are the Adirondack Cottage Sanatorium for Consumptives, built up by Dr. E. L. Trudeau (q.v.), and the State Hospital for Incipient Tuberculosis, and, in the village, a laboratory for the study of tuberculosis. Pop., 1900, 2594; 1910, 4983.

SARANSK, sȧ-rȧnsk′. The capital of a district in the Government of Penza, Russia, on the Saranka, 87 miles north of the city of Penza (Map: Russia, G 4). It is of commercial importance on account of its fair. Pop., 1897, 13,743; 1910, 15,281.

SARAPIS. See SERAPIS.

SARAPUL, sä′rȧ-pōōl′. A district town in the Government of Viatka, Russia, situated on the Kama, about 225 miles southeast of Viatka (Map: Russia, H 3). It has extensive tanneries and boot factories and a considerable trade in grain. Pop., 1897, 21,305; 1910, 19,658.

SARA SAMPSON, MISS. A play by Lessing produced in 1755. Its sentimentality made it popular in its day, but it is interesting now only as the first introduction of middle-class life in German tragedy.

SARASATE, sä′rȧ-sä′tȧ, PABLO DE (1844–1908). A Spanish violinist, born in Pamplona. He studied the violin at the Paris Conservatory under Alard and harmony under Reber, winning prizes in 1857 and 1859. In 1889 he visited the United States with Eugène d'Albert. His playing was characterized by a wonderful technique and a delicate and refined tone. Max Bruch wrote for him his Scottish fantasy and second concerto and Lalo his concertos and *Symphonie espagnole*. Sarasate's compositions are for his own instrument and are light and Spanish in character. Consult J. Altadill, *Memorias de Sarasate* (Pamplona, 1910).

SARASIN, sä′rȧ′zăn′, PAUL (1856–). A Swiss naturalist and traveler, born in Basel and educated there and in Würzburg, where he graduated in 1882. Together with his cousin, Friedrich Sarasin, he explored Ceylon (1883–86), and they published on their return *Ergebnisse naturwissenschaftlicher Forschungen auf Ceylon* (1887–93), containing valuable zoölogical and ethnological data. After a second trip to Ceylon in 1890, they turned their attention to the island of Celebes, which they explored in 1893–96 and 1901–03, and which they described in *Materialien zur Naturgeschichte der Insel Celebes* (1898) and *Reisen in Celebes* (1905). Paul went to the same island again in 1907, while Friedrich, with J. Roux, visited New Caledonia in 1911–12.

SARASVATI, sȧ-rȧsh′vȧ-tē. See VĀC.

SAR′ATO′GA, BATTLES OF. Two important battles of the American Revolution, fought on Sept. 19 and Oct. 7, 1777. Early in May, 1777, Burgoyne, with an English army of about 10,000, started from Canada towards Albany with the hope of meeting Lord Howe coming up the Hudson and so cutting off New England from the other Colonies. His army was weakened by Baum's defeat at Bennington (q.v.) and by the frequent guerrilla attacks of the American militia. Crossing the Hudson on September 13, he approached Bemis Heights, where the American army, under General Gates (q.v.), had taken up a strong position. On the 19th he advanced with 4000 men to attack the American left, but was met by Gen. Benedict Arnold with a force of 3000 at Freeman's Farm. Here a battle raged for two hours, until darkness intervened, neither side gaining a decisive advantage and each side losing from 600 to 1000 men. This has been variously called the battle of Freeman's Farm, the first battle of Bemis Heights, the first battle of Stillwater, and the first battle of Saratoga. Burgoyne, finding that his supplies were cut off and despairing of any immediate aid from Lord Howe, resolved to hazard another attack. Accordingly on October 7 he advanced, with 1500 picked men, to turn the American left. Immediately his right was attacked by General Poore and his left by General Morgan; while Arnold, though then without technical authority, dashed to the front and took general command of the American forces. For some time the result remained in doubt, but the English gradually gave way after the gallant commander of their right, General Frazer, had been mortally wounded; and by a final attack, in which Arnold was severely wounded, they were forced behind their intrenchments. This engagement has also been called by some the battle of Bemis Heights, or of Stillwater. During the night the English retreated and took up a strong position about 12 miles from Saratoga (q.v.), on the site of the present Schuylerville. Meanwhile American recruits were swarming in, and soon Burgoyne was surrounded, his supplies cut off, and his forces confined, by a continual bombardment, within narrow lines. Not daring to risk another battle and fearing an attack from vastly superior numbers, he opened negotiations with Gates, who at first demanded an unconditional surrender, but subsequently, on the 16th, agreed to what was called the Convention of Saratoga. The English were to march out with the honors of war and were to be allowed to embark at Boston for England on condition that they would not serve again in America during the war. Accordingly on the 17th Burgoyne formally surrendered his army of between 5000 and 6000 men to Gates. Congress subsequently refused to ratify the convention, and the British troops, excepting a few officers, were detained as prisoners, first in the vicinity of Boston and later at Charlottesville, Va., and elsewhere, until the close of the war. The victory aroused enthusiasm throughout the country and was the determining event that led France to form an alliance with the United States. Consult: H. B. Carrington, *The Battles of the American Revolution* (New York, 1876); W. L. Stone, *The Campaign of Lieut.-Gen. Burgoyne* (Albany, 1877); J. H. Brandow, *The Story of Old Saratoga* (ib., 1901); also Baron Riedesel, *Memoirs and Letters and Journals* (trans. by Stone, Albany, 1868).

SARATOGA SPRINGS. A city in Saratoga Co., N. Y., 39 miles north of Albany, on the Delaware and Hudson and the Boston and Maine railroads (Map: New York, G 4). It is one of the leading summer resorts in the United States, with mineral springs, having a wide reputation. Races are held here during August, and the pageant and the floral fête held respectively in July and September offer brilliant spectacles. Saratoga Lake, 4 miles distant, is much frequented. The city has large and famous hotels, a Convention Hall seating 5000, the Skidmore School of Arts, an Athe-

næum, the library of the Fourth Judicial District, St. Faith's School, St. Christina Home for Orphans, a hospital, and a State armory. The industries are the bottling of mineral waters, manufactures of drugs and medicines, silk gloves, furniture, paper-mill machinery, and foundry products. In the city park of 10 acres are the Casino (formerly "Canfield's") and the Trask Memorial fountain, with French's bronze, "The Spirit of Life." The village dated from 1789. A city charter and a commission form of government were adopted in 1915. Pop., 1900, 12,409: 1910, 12,693; 1915, 12,864; 1920, 13,181.

In 1693 Major Peter Schuyler defeated a large force of French and Indians about 3 miles from the present city. Father Isaac Jogues was the first white man to see the High Rock Spring, in 1643. Sir William Johnson was brought here by the Indians in 1767. About 1773 a log cabin was built near here, by Derick Scowton. The State owns, in reservations of 340 acres, 160 wells and spouting springs, furnishing radioactive alkaline-saline mineral water supersaturated with carbonic acid gas, and useful in digestive, joint, and other disorders, and especially in heart and arterial diseases, through its use in the Nauheim system of baths. Consult: Stone, *Reminiscences of Saratoga* (New York, 1875); "Saratoga," in L. P. Powell (ed.), *Historic Towns of the Middle States* (ib., 1899); J. H. Brandow, *The Story of Saratoga and History of Schuylerville* (Albany, 1901); *Annual Reports of Saratoga Springs Reservation Commission.* See SARATOGA, BATTLES OF.

SARATOV, sä'rå-tôf'. A government of Russia (Map: Russia, F 4). Area, 32,624 square miles. The surface is elevated and well wooded in the north, while the central and southern parts have the character of a steppe. The region along the Volga is hilly. Besides the Volga the principal rivers of the government are the Medvieditsa, the Khoper, and the Ilovlya, all tributaries of the Don. Saratov lies in the black-soil belt. Agriculture is carried on extensively, and large quantities of grain are exported by the Volga. The principal cereals are rye, wheat, and oats. Tobacco is cultivated on a large scale, and gardening for export forms an important occupation in the region along the river. The breeding of cattle is another important occupation here, while bee raising is a growing source of income. The annual value of the manufactures, principally flour, is over $12,000,000. The export trade in grain is heavy. Pop., 1912, 3,156,100, mostly Great and Little Russians.

SARATOV. The capital of the government of the same name in Russia, situated on the Volga, about 200 miles southwest of Samara (Map: Russia, G 4). It is well laid out, but, like most Russian provincial towns, is built chiefly of wood. It has a university (founded in 1909), a theological seminary, a museum with a school of drawing and a library attached to it. Flour mills, oil presses, and distilleries are the principal industrial establishments of the city. The export trade in grain is considerable. Pop., 1910, 217,418, including many descendants of French and German settlers. The town was founded in the sixteenth century.

SARAVIA, sä-rä'vyä. A town of Negros Occidental, Philippine Islands, situated on the northwest coast, 15 miles north of Bacólod. Pop., 1903, 13,132.

SARAWAK, sä-rä'wäk. A British protectorate on the northwest coast of Borneo (q.v.) (Map: East India Islands, D 5).

SARAWAKESE, sä'rä-wäk'ēz' *or* -ēs'. The natives of Sarawak in northwestern Borneo, comprising the Punans (various wild but gentle tribes of savages scattered over the interior—nomadic hunters representing the lowest type of culture); Kalamantan (more or less agricultural communities belonging to scattered and usually weak tribes along the coast and certain rivers); Kenyah-Kayan (immigrants several centuries ago from Dutch Borneo—well-organized and powerful tribes who have exterminated or enslaved some of the smaller aboriginal groups); Iban, or Sea Dyaks (originally on Batang Lupan and Saribas rivers, their spread being comparatively recent); and Malays (now rather mixed by contact with indigenous coast populations) on the coast and for a short distance up some of the rivers. Consult: Brooke, *Ten Years in Sarawak* (London, 1866); Denison, *Tour among the Land Dyaks of Upper Borneo* (Singapore, 1879); Roth, *The Natives of Sarawak and British North Borneo* (London, 1896); Baring-Gould and Bampfylde, *History of Sarawak under its Two White Rajahs, 1839–1908* (ib., 1909); E. H. Gomes, *Seventeen Years among the Sea Dyaks of Borneo* (Philadelphia, 1911).

SARCEY, sär'sä', FRANCISQUE (1828–99). A French dramatic critic born at Dourdan. He taught in the provinces (1851–58), on coming to Paris wrote first for the *Figaro*, and in 1859 became dramatic critic of *L'Opinion Nationale* (1859–67) and then of *Le Temps*, with which he was connected till his death, contributing also to About's *Dix-neuvième Siècle* and other journals. Public-spirited, but never partisan, he voiced with lively wit and shrewd common sense the average opinion in drama and in social reform. Sarcey is often charged with excessive admiration of mere stagecraft. His dramatic articles were not collected during his life, save for two series of *Comédiens et comédiennes* (1878–84) and *Le théâtre* (1893). Sarcey wrote also *Souvenirs de jeunesse* (1885) and *Souvenirs d'âge mûr* (1892), translated by Carey, *Recollections of Middle Life* (1893) and reissued as *Conférences et conférenciers* (1897); an *Histoire du siège de Paris* (1871); and several novels. His *Quarante ans de théâtre* (8 vols., 1900 et seq.) is particularly important. Consult Brander Matthews, *Studies of the Stage* (New York, 1894), and Heinrich Behrens, *Francisque Sarceys Theaterkritik* (Griefswald, 1911), containing a bibliography.

SAR'CINA (Neo-Lat., from Lat. *sarcĭna*, bundle), or SARCINULA. A genus of minute organisms of low organization, sometimes reckoned as algæ and sometimes as fungi. A number of species are known. Although the most common seat of sarcinæ is the human stomach, they have likewise been detected in the stomach of the tortoise, the rabbit, the dog, the ape, and in the cæcum of the fowl; in the urine, in the lungs, in the fæces and intestinal canal, in the fluid of the ventricles of the brain, in cholera stools, in the fluid of hydrocele, and in the bones.

Sarcinæ are present in vomited fluids in certain forms of dyspepsia. See BACTERIA.

SARCINE, sär'sin. See HYPOXANTHINE.

SAR'COLAC'TIC ACID. See LACTIC ACID.

SAR'COLEM'MA (Neo-Lat., from Gk. *σάρξ*,

sarx, flesh + λέμμα, *lemma*, husk). A term applied to the delicate sheath which invests each primary muscle fibre. See MUSCLE.

SARCO'MA. See TUMOR.

SARCOMA, MEDULLARY. See MEDULLARY SARCOMA.

SARCOPH'AGUS (Lat. *sarcophagus*, from Gk. σαρκοφάγος, *sarkophagos*, flesh-eating, from σάρξ, *sarx*, flesh + φαγεῖν, *phagein*, to eat). Any large coffin designed not to be buried, but to be placed in the open air or in a tomb where it may be seen. The material is usually stone. In ancient belief coffins made from a certain stone found near Assus in Asia Minor possessed the property of consuming the body with the exception of the teeth within 40 days. (Pliny the Elder, *Historia Naturalis*, xxxvi, 27.) In Egypt the sarcophagus is the dwelling of the dead. In the great tombs of the pyramid builders (see PYRAMID) and later kings it is a huge block of granite in which is hollowed a receptacle for the mummy case, while another block forms the cover. The original idea of the sarcophagus as a house is sometimes indicated by the rounded roof of the sarcophagi. In poorer tombs sarcophagi are of clay or wood, painted or decorated with inlaid work in glass and paste. (See MUMMY CASE.) About the seventh century B.C. another form of stone sarcophagus reproduces the mummy case, showing the human head and outline of the swathed form, especially in Phœnicia and Phœnician lands, such as Cyprus, Carthage, and some of the Sicilian settlements. Especially noteworthy is a large group of these "anthropoid" sarcophagi, made of white Greek marble and showing clear proof in the human heads, sculptured in relief on the lids, of Greek workmanship. This series begins shortly after the Persian wars and continues down to about the time of Alexander the Great. Among the Greeks the use of sarcophagi seems to have been borrowed from the East and appears first in Asia Minor. In general, the Greek and the Asiatic sarcophagi are distinctly of the house or temple type, often showing in relief gables, columns, and other architectural details. On the early sarcophagi of Cyprus these forms are less clear, and the custom of decorating the sides with scenes in relief is found. In Greece, sarcophagi proper were not used till late in the fifth century and do not seem to have been very generally employed at any time. Greek sarcophagi are consequently not numerous, and the finest specimens were found in a tomb at Sidon (q.v.), in 1887. Of the 17 sarcophagi there found one is an Egyptian anthropoid, and the others Greek, four of them being richly decorated with reliefs. The earliest of these, the sarcophagus of the satrap, belongs to the time shortly after the Persian wars and shows Ionic art of the transitional period. The Lycian sarcophagus is evidently of the end of the fifth century and was inspired by the sculptures of the Parthenon. To the earlier fourth century belongs the sarcophagus of the mourners, in the form of a temple, between the columns of which are standing or seated women, whose faces and attitudes are the embodiment of woe. It is clearly the work of an artist who was familiar with the great Athenian grave reliefs. From Clazomenæ in Asia Minor come interesting sarcophagi, 20 or more in number, scattered now in various museums, which are, "on the whole, the most satisfactory examples of Ionic Ceramic painting which exist." (Fowler-Wheeler, cited below, 461–463.) Lastly, near the end of the fourth century was produced the wonderful Alexander sarcophagus, with its vigorous scenes of the battle and the chase, reproduced in a striking combination of relief and color. This sarcophagus is now in Constantinople.

The Etruscans early employed sarcophagi of stone or clay, with the sides decorated in relief, while on the lid, which has the form of a couch, recline the full-length figures of the dead, singly or, not infrequently, in pairs. The Etruscan artist evidently drew his inspiration from Greek sources. Owing to the Roman custom of burning the dead, sarcophagi are very rare during the Republic and the early Empire. The finest and earliest example is the peperino sarcophagus of L. Cornelius Scipio Barbatus, consul 298 B.C., now in the Vatican. The house form has here passed over into a style much more nearly resembling an altar. In the second century of our era, however, burial became much more common, and with this period begins the long series of sculptured sarcophagi so common in museums. Especially noteworthy are four specimens now in Rome: the Niobid sarcophagus in the Lateran, the Penthesilea in the Vatican, the Lycomedes sarcophagus in the Capitoline Museum, and a huge example in the Museo delle Terme, which represents a battle between Romans and barbarians. In general the architectural forms are entirely neglected, nor is the Etruscan imitation of the bed retained, even when there is a reclining figure on the lid. Moreover, while the Greek sarcophagi seem in general to have stood in the open air as grave monuments and hence were sculptured on all sides, the Roman, like the Etruscan, were placed against the walls of tomb chambers, so that the back is usually plain. Along with the usual rectangular oblong box we find an oval commonly decorated with vertical waving lines, while on the front is a medallion containing a mythological scene or a portrait. In the Roman sarcophagi the decoration of the front with an elaborate composition in relief plays an important part. Sometimes the theme is drawn from daily life, but more often the mythology of Greece has been used. The custom was continued in Christian times, with the substitution of biblical scenes for those of pagan myths.

Bibliography. Charles Robert, *Die antiken Sarkophagreliefs* (Berlin, 1890–97); Hamdi Bey and Reinach, *Une nécropole royale à Sidon* (Paris, 1892 et seq.); Walter Altmann, *Architektur und Ornamentik des antiken Sarkophags* (ib., 1902); Carl Watzinger, *Griechische Holzsarkophage aus der Zeit Alexander des Grossen* (Leipzig, 1905); E. S. Strong, *Roman Sculpture from Augustus to Constantine* (London, 1907); Zahn, *Archäologisches Jahrbuch*, vol. xxiii (Berlin, 1908); Fowler, Wheeler, and Stevens, *A Handbook of Greek Archæology* (New York, 1909); E. A. Gardner, *A Handbook of Greek Sculpture* (London, 1911); R. B. Richardson, *Greek Sculpture* (New York, 1911); J. L. Myres, *Handbook of the Cesnola Collection of Antiquities from Cyprus* (ib., 1914).

SARD (Lat. *sarda*, *sardius*, from Gk. σάρδιος, *sardios*, Sardian, from Σάρδεις *Sardeis*, Sardis, capital city of Lydia). A translucent red variety of chalcedony that differs from carnelian by the deepness of its color. It was highly prized by the ancients, who used it as a gem.

It was credited by early writers with numerous virtues, and, according to Epiphanius, it conferred upon its wearer a "cheerful heart, courage, and presence, and protected him from witchcraft and noxious humors." See GEMS.

SAR'DANAPA'LUS (Lat., from Gk. Σαρδανάπαλλος). The Greek form of Asurbanipal, one of the last kings of Assyria (668–625 B.C.). It is probably a corruption of *Sarbanapallos*, but both Herodotus and Ktesias wrote *Sardanapallos*. The story of his luxury, effeminacy, immorality, and tragic end through his own order that the palace in which he reposed with his Queen and concubines on golden beds be delivered to the flames, comes from Ktesias, whose account was copied by Diodorus, Athenæus, and many other Greek and Roman writers. It is thought by some scholars that Ktesias confused Asurbanipal with Sinsariskun (Sarakos), who, according to Abydenus, burned himself with his palace. This narrative, which may have been drawn from Berosus, is not improbable, but has not yet been verified by any cuneiform document. The classical material was most fully discussed by Koopmanns, *De Sardanapalo* (Amsterdam, 1819), and the most important texts were published by C. Müller, *Ctesiæ Fragmenta* (Paris, 1844). For the known historic facts concerning the reign of Asurbanipal, see ASSYRIA and the references there given.

SAR'DES. An ancient city of Asia Minor. See SARDIS.

SAR'DICA, COUNCIL OF. A council held, probably in the year 343, at Sardica, the present Sofia, in Bulgaria. It was summoned by the emperors Constantius and Constans, in concert with Pope Julius I, to discuss the difficulties arising from the deposition of St. Athanasius and other bishops and generally testifying against innovations in doctrine in regard to the person of Christ. The Eastern bishops withdrew and held a council of Philippopolis, whence they sent out the decrees of the Council of Sardica. The Western bishops also passed certain canons relating to the transfer and trial of bishops, which have been important in the subsequent history of the Church. By some scholars, such as Baronius and Mansi, an ecumenical character has been attributed to it, but this is denied by the great majority. Consult: H. M. Gwatkin, *Studies of Arianism* (Cambridge, 1900); J. Friedrich, *Die Unechtheit der Canones von Sardika* (Vienna, 1902); and the histories of the councils.

SARDINE, sär-dēn' *or* sär'dēn (Lat. *sardina, sarda*, from Gk. *σαρδήνη, σάρδα*, sardine, from Σαρδώ, *Sardō*, Sardinia). One of the small fishes

A FOSSIL SARDINE.

of the herring family (Clupeidæ) which are preserved in oil and canned; properly, the European *Clupea pilchardus*, very common in the Mediterranean and adjoining ocean, appearing in great shoals. Many young fishes of related species, however, are also utilized in the same way and mixed with them. In curing sardines they are first carefully eviscerated, washed, and then exposed to the sun or to a current of air under cover. They are next put into boiling oil, in which they remain for a short time, then taken out, drained, and put into square tin boxes. The boxes packed with sardines are filled up with oil, the lid is soldered on, and they are placed for a short time in boiling water or exposed to hot steam. In the south of France sardines are sometimes cured in red wine and then known as "sardines anchoisées."

Several species of small Clupeidæ much resembling the sardine are found in various parts of the world and are used in the same way as the sardine of the Mediterranean. The California sardine (*Clupea cœruleus*) closely resembles the European sardine, gets about 12 inches long, and is an excellent food fish, but is not canned. The sardine fisheries are very extensive, both in America and Europe. (See FISHERIES.) In the Eastern States the young of several small fishes have been put up in oil, like sardines, especially young menhaden, and sold under various trade names. They are cheap and acceptable, but not so good as true sardines. The output of the sardine canneries of the United States exceeds that of any other country. It is chiefly consumed in the United States. Consult: G. B. Goode, *Fishery Industries*, sec. i (Washington, 1884); H. M. Smith, *French Sardine Industry*, published by the United States Fish Commission (ib., 1901); and Louis Fage, "Recherches sur la biologie de la sardine," in *Archives de zoölogie expérimentale et générale*, vol. lii (Paris, 1913). See ANCHOVY; PILCHARD; and Plate of HERRING AND SHAD.

SARDIN'IA (It. *Sardegna*, Gk. Σαρδώ, *Sardō*). An island belonging to Italy, next to Sicily the largest island in the Mediterranean Sea. It is situated between lat. 38° 52′ and 41° 16′ N., and between long. 8° 8′ and 9° 49′ E., south of Corsica, from which it is separated by the Strait of Bonifacio, 9 miles wide (Map: Italy, B 4). The nearest point of the Italian mainland lies 115 miles northeast of the northeast extremity of the island. Sardinia is 168 miles long and 89 miles wide. Its area is 9306 square miles, including the small islets along the coasts.

The greater part of the island is mountainous, especially along the east coast, but it is less elevated than Corsica. The highest point is Monte Gennargentu, near the centre of the island, with an altitude of 6365 feet. The southwestern mountain group, containing the richest mineral deposits, is separated from the remaining highland by the low plain of Campidano, running with a breadth of 12 miles between the gulfs of Cagliari and Oristano. The rivers are all unimportant. The climate is mild, like that of the other Mediterranean lands, and very warm in summer. The average annual rainfall is only 17 inches, and the summers are very dry. The small plains are swampy and subject to malaria. In spite of the drought the vegetation is rich, and forests still cover about one-fifth of the area. The date palm is here indigenous. Geologically the island consists almost wholly of crystalline rocks with granite predominating. The plain of Campidano is covered with Tertiary deposits, and in the south there are Paleozoic strata rich in copper and silver-lead ores.

Some of the mines were worked by the Car-

thaginians and the Romans. Subsequently mining was resumed at various times, but especially in the nineteenth century, and has now assumed extensive proportions. In 1911 it gave employment to 15,508 persons, of whom 14,705 were in the Province of Cagliari. The principal minerals are lead, silver, zinc, antimony, lignite, granite, and salt. The last is a state monopoly. The value of the annual mineral output is about $4,000,000, from 4017 manufacturing establishments.

Sardinia is, like Sicily, an agricultural country with a fertile soil, but the agricultural conditions differ greatly in the two islands. The minute holdings of Sardinia present a striking contrast to the extensive estates and the large proportion of the landless class of Sicily, while the gradual adoption of modern methods in the former island compares favorably with the backwardness prevailing in the latter. In 1912, 216,000 hectares were planted to wheat, yielding 1,258,000 metric quintals. The area planted to the vine in 1912 was 46,400 hectares, yielding 675,000 hectoliters. Viticulture has attained a very high state of development in Campidano in the Province of Cagliari. Olives are cultivated on the western coast. Stock raising is also progressing, and the native breed of cattle is being improved by importations from abroad.

Sardinia exports principally minerals, wine, olives, salt, fish, and charcoal, and imports cotton and woolen goods, coal, iron products, and various manufactures. Since the conclusion of the Franco-Italian Treaty in 1898 the commerce has increased. The island is well provided with transportation facilities and has a considerable coastwise shipping. It is divided into two provinces, Cagliari and Sassari. Education is at a low ebb, although considerable progress, especially in technical instruction, has been made of late. There are universities at Cagliari and Sassari. Pop., 1901, 791,754; 1911, 852,407; 1913, 863,215. Capital, Cagliari (q.v.).

Ethnology. Owing to their isolation, the Sardinians are one of the most homogeneous ethnic groups in Europe. They have the shortest stature, many of them measuring only 50 to 60 inches, the brownest eyes and hair, less than 1 per cent being fair-complexioned, and the longest heads of all the Italian populations. The height of Sardinian soldiers is given as 1.619 meters (63.5 inches).

History. Sardinia, at first called by the Greeks Ichnusa and Sandaliotis, from its resemblance to a human footprint, and afterward Sardo, a word of Phœnician derivation, was colonized at a very early period. Archæologists have thought they found remains of a very ancient Phœnician occupation and perhaps of a subsequent one by Egyptians, but these are largely speculations, as are the surmises concerning the primitive inhabitants. The first really historical event is the partial conquest of the island by the Carthaginians about 550 B.C. They made the island a great grain-producing country. They practically completed the conquest in 260 B.C., but in 239, when Carthage was threatened by a revolt of her mercenaries, Rome accepted the island from the mutinous troops and made it a province of the Republic. It was not reduced to complete submission until 235 B.C. It was guarded with care by Rome, as a natural part of her western Mediterranean domain and as one of the valuable granaries of the capital.

Sardinia fell into the hands of the Vandals in 456 A.D., was subjected to the Eastern Empire in 534, and was invaded by Saracens in the eighth century. These were driven out in their turn by the Pisans and Genoese in the eleventh century, and the island was bestowed by the Pope upon Pisa, one of whose deputy governors obtained the erection of Sardinia into a kingdom (1164) by Frederick I. Frederick II made his son Enzio King of Sardinia in 1241, but in 1250 the Pisans reconquered the island. The popes, who had long claimed a right of suzerainty over the island, gave it in 1297 to James II of Aragon, and it continued in the possession of Spain till 1708, when it fell into the hands of the British. By the Peace of Utrecht (1713) it was given to the Elector of Bavaria and by him transferred to Austria in the following year in exchange for the Upper Palatinate. In 1720 Austria gave it to the Duke of Savoy in exchange for Sicily, and it has since that time formed a part of the dominions of the house of Savoy.

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SARDINIA, KINGDOM OF. A former Italian kingdom and the nucleus of the present Kingdom of Italy. It included the duchies of Savoy, Aosta, and Genoa, the former Duchy of Montferrat, part of the old Duchy of Milan, the Principality of Piedmont, the County of Nice, and the islands of Sardinia and Caprera.

The modern Kingdom of Sardinia originated in a treaty (Aug. 24, 1720) between Austria and the Duke of Savoy (q.v.), by which the latter agreed to surrender Sicily on receiving in exchange the island of Sardinia and the erection of his states into a kingdom. Of the Kingdom thus constituted the island which gave its name was held in slight regard, the principal territories being on the mainland. The active life of the Kingdom was in Piedmont (q.v.), where was Turin, the royal capital, and Piedmont is frequently referred to in nineteenth-century history instead of Sardinia. In 1730 Victor Amadeus I, the last Duke of Savoy and first King of Sardinia, resigned the throne to his son, Charles Emmanuel I (1730–73). The latter, by joining with France and Spain against Austria, obtained (1738) the territories of Tortona and Novara, to which were further added (1748) the County of Anghiera and other districts. Charles Emmanuel was the author of the code known as the *Corpus Carolinum.* During the reign of Victor Amadeus II (1773–96) the French Revolutionary armies invaded Savoy, and the victories of Napoleon led the King to conclude peace in 1796 at the sacrifice of Savoy and Nice. Cuneo, Alessandria, and Tortona were garrisoned by French troops. Charles Emmanuel II (1796–1802) was at first an ally of France; but the Directory in 1798 compelled him to give up Piedmont, which in 1802 was incorporated with France. In that

year Victor Emmanuel I succeeded Charles Emmanuel, his realm being limited to the island of Sardinia. The Congress of Vienna (1814–15) reinstated the house of Savoy in its former possessions, to which the territories of the extinguished Republic of Genoa were added. Victor Emmanuel I (1802–21) made his entry into Turin May 20, 1814. His return restored the ancient misgovernment; and the reactionary policy in this and other Italian states called forth the activity of the Carbonari (q.v.) and other secret associations, whose aims were supported by a portion of the nobility and army and by the heir presumptive to the throne, Charles Albert, Prince of Savoy-Carignan. The military insurrection in March, 1821, brought on a general revolution. The King abdicated in favor of his brother, Charles Felix (1821–31), the Austrians came to the rescue of absolutism, and the revolutionary movement was quelled. On the death of Charles Felix the elder line of Savoy became extinct, and the succession fell to the cadet branch of Savoy-Carignan (see SAVOY, HOUSE OF), whose rights had been recognized by the Congress of Vienna, and Charles Albert (1831–49) ascended the throne. The Liberals were gratified with some slight reforms, but the power of the clergy was untouched. The internal administration was, however, carried on with energy. In 1842 the King began a gradual but progressive liberal policy, relaxed the severity of the censorship, reformed the judicial administration and prison discipline, and abolished the feudal system in Sardinia. On Feb. 8, 1848, the King announced a new and extremely liberal constitution, which was proclaimed some weeks afterward; a parliament was convoked in April. In the midst of these changes the Revolution in southern and central Italy broke out, and Charles Albert, who was saluted with the title of "the Sword of Italy," put himself at the head of the movement and declared war against Austria. On the day after the fatal rout of Novara (March 23, 1849) Charles Albert abdicated and was succeeded by his son, Victor Emmanuel II. Further history of Sardinia is merged with that of Italy (q.v.).

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SARDIS, sär'dĭs, or **SARDES** (Lat., from Gk. Σάρδεις, *Sardeis*, Ionic Σάρδιες, *Sardies*, Σάρδις, *Sardis*). An ancient city of Asia Minor, the capital of Lydia (q.v.), situated at the northern base of Mount Tmolus, on the Pactolus, 60 miles east-northeast of Smyrna (Map: Greece, Ancient, F 2). The city is first mentioned by Æschylus. It was taken by the Cimmerians (q.v.) in the reign of King Ardys (680–631 B.C.). In the reign of Crœsus, the last Lydian King, Sardis attained its highest prosperity. It became the residence of the Persian satraps after the overthrow of the Lydian monarchy. The Ionians burned it about 499 B.C., and a little later Xerxes assembled his vast army at Sardis for the invasion of Greece. It was of importance under the Romans. It had one of the seven churches mentioned in the Book of Revelation. The town was almost completely destroyed by Timur in 1402.

Prior to 1910 some traces of the ancient city, dating mostly from Roman times, had still been visible, notably two columns of the famous Ionic temple, supposed to be that of Cybele, and the tomb of Alyattes. Attempts to excavate Sardis had also been made, e.g., by G. Dennis (1882) and by M. Mendel (1904). Later, permission to excavate was ceded by the Turkish government to Prof. Howard Crosby Butler of Princeton University, who began work in March, 1910. Much of the old city, which lies between the Acropolis and the Pactolus, has been uncovered, though the great depth (20 to 30 feet) to which landslides have buried the ruins made the work difficult. The whole temple, which proved to be a temple of Artemis, has been laid bare. It is over 300 feet long; it had 20 columns on each side and 8 on each end. The columns, again, are over 6 feet in diameter and about 58 feet high. The temple was erected at the beginning of the fourth century B.C. Of very great interest, too, and doubtless of great importance are the many tombs on the mountain side, across the Pactolus, excavated by Mr. Butler's colleague, W. H. Buckler. In these, and elsewhere in the ruins, many important inscriptions were found, including numerous inscriptions in Lydian which, it is hoped, may help in deciphering the Lydian language. Objects of gold, silver, bronze, and pottery were found in these tombs: some of the pottery resembles that of the Mycenæan age in Greece. Consult "Archæology and Asia Minor," in the NEW INTERNATIONAL YEAR BOOK (New York, 1910–14); H. C. Butler, "Preliminary Report on the American Excavations at Sardes in Asia Minor," in the *American Journal of Archæology*, vols. xiv–xviii (ib., 1910–14). For the inscriptions found at Sardis in 1910–14, consult Robinson and Buckler, "Greek Inscriptions from Sardes," in *American Journal of Archæology*, vols. xvi–xviii (New York, 1912–14).

SAR'DONYX (Lat. *sardonyx*, from Gk. σαρδόνυξ, sardonyx, from *σάρδιος*, *sardios*, sard, from Σάρδεις, *Sardeis*, Sardis, the ancient capital of Lydia in Asia Minor + ὄνυξ, *onyx*, onyx, nail). A variety of quartz. It resembles onyx and usually consists of layers of red (carnelian) and white (chalcedony). It finds some use as a gem, being employed for brooches and other forms of jewelry. See GEMS.

SARDOU, sär'dōō', VICTORIEN (1831–1908). A French dramatist, born in Paris. He at first studied medicine, then history, taught for a time, and, failing in early dramatic efforts, of which *La taverne des étudiants* (1854) was the first acted, he became a hack journalist and writer. He fell into poverty and was nursed through a fever by Mademoiselle de Brécourt, afterward his wife, who introduced him to the noted actress and theatrical manager Mademoiselle Déjazet, for whom he wrote plays of ephemeral popularity, among them *Monsieur Garat* (1860). When he had once achieved notoriety, Sardou produced comedies with astonishing rapidity: four in 1861 (*Les pattes de mouche*, from Poe's *Purloined Letter*, *Piccolino*, *Les femmes fortes*, *Nos intimes*); three in 1862 (*Les ganaches*, a satire on the republican agitation, *La papillonne*, *Les premières armes de Figaro*); and nearly a score in five years, all brilliant in dialogue, all genre pictures of modern social life, never serious or stern in moralizing, bitter only in *Les ganaches*, almost always successful. Of these the best is *La*

famille Benoîton (1865). The same vein was pursued during the last years of the Empire (*Seraphine*, 1868; *Patrie*, 1869; *Fernande*, 1870), with a political digression in *Nos bons villageois* (1866). That Sardou was a sincere Bonapartist he showed after Napoleon's downfall in *Le roi Carotte* (1871) and *Ragabas* (1872), a fierce attack on Gambetta, with Napoleon III and Garibaldi in the background. In 1878 he entered the Academy and in 1880 aroused clamor if not applause by *Daniel Rochat*, a plea for civil marriage, and (with Najac) *Divorçons*, a daring farce, which had a financial success then almost unparalleled in France. The plays of the eighties are more significant. *Odette* (1881) and *Fédora* (1882) show social and political satire developing into character study, centred round a single figure, usually a woman. In this vein *Seraphine*, *Fernande*, and *Dora* (1877) were early experiments. *Théodora* (1884), *Georgette* (1885), and *La Tosca* (1887) lead up to the historic and spectacular dramas of the nineties: *Cléopâtre* (1890), *Thermidor* (1891), *Madame Sans-Gêne* (1893), *Gismonda* (1894), *Marcelle* (1895), *Robespierre* (1898), *Dante* (1903), and *La Sorcière* (1903). Of this style *Patrie* (1869) and *La haine* (1874) were the forerunners. These later plays were composed to be heard and seen, not to be read, and they have not been published. Occasional scenes show literary elaboration, but the general effect is of exalted vaudeville. Sardou's importation into serious drama of sensation and spectacle has tended to corrupt the stage and to make it artificial and insincere. *Les pattes de mouches* was translated as *A Scrap of Paper* and revived in New York in 1914, and *Divorçons* was successfully played in the same city. Many of his plays, such as *La Tosca*, were made into grand operas, and a number were written for Sarah Bernhardt. Consult: Léopold Lacour, *Trois théâtres* (Paris, 1880); J. Sarrazin, *Das moderne Drama der Franzosen in seinen Hauptvertreten* (Stuttgart, 1888); René Doumic, *Ecrivains d'aujourd'hui* (Paris, 1895); Brander Matthews, *French Dramatists of the Nineteenth Century* (new ed., New York, 1901); J. A. Hart, *Sardou and the Sardou Plays* (Philadelphia, 1913).

SARGASSO (sär-găs'sō) **SEA.** The region of the Atlantic Ocean from about lat. 20° to 35° N. and between the Azores and the Bahamas is thus known because of the large amount of seaweed, particularly of the form *Sargassum bacciferum*, which it contains. It lies in the eddy of the great system of currents, so that the waters carry very little sediment and are remarkably clear and transparent. The seaweed includes other types than the one named, which, however, is the most common. The forms have no organs of attachment, but are supplied with air cells causing them to float at the surface, where they are blown about by winds.

SARGASSUM, sär-găs'sŭm. A genus of floating marine algæ belonging to the Phæophyceæ (q.v.), one species of which, *Sargassum bacciferum*, occurs in great abundance floating, by means of the bladder-like swellings of the thallus, on the surface of the so-called Sargasso Sea, a region of comparatively still water in the North Atlantic Ocean north of South America in lat. 20° to 35° and long. 30° to 70° W.

SARGASSUM FISH. See Mouse Fish.

SAR'GENT, Charles Sprague (1841–). An American arboriculturist, born in Boston and educated at Harvard (class of 1862). He served in the Federal army in 1863–65. He became director of the Arnold Arboretum at Cambridge in 1872 and in 1879 was appointed professor of arboriculture in Harvard University. Sargent planned the Jesup collection of woods, now in the American Museum of Natural History, New York City. He edited the posthumous papers of Asa Gray in 1889 and wrote: *Report on the Forests of North America* (1884); *Forest Flora of Japan* (1894); *Silva of North America* (14 vols., 1891–1902); *Manual of the Trees of North America* (1905); *A Guide to the Arnold Arboretum* (1911). In 1887–97 he was editor of *Garden and Forest* and in 1913–14 edited *Plantæ Wilsonianæ*. He was elected to the National Academy of Sciences in 1895.

SARGENT, Epes (1813–80). An American editor, poet, and dramatist. He was born at Gloucester, Mass., and educated at Harvard College. After holding editorial positions on Boston and New York papers he was for several years after 1846 editor of the Boston *Transcript*. Later he devoted himself to preparing school textbooks and popularizations of literature. He wrote four dramas, a number of stories for young people, a volume of poems, and miscellaneous works, among which may be named: *The Life and Services of Henry Clay* (1843); *American Adventure by Land and Sea* (1847); *Arctic Adventures by Sea and Land* (1857). He is chiefly remembered for the song "A Life on the Ocean Wave."

SARGENT, Frank Pierce (1854–1909). An American labor leader and government official, born at East Orange, Vt. From traveling photographer, factory hand, and cavalryman, he became, in 1880, a fireman on the Southern Pacific Railroad. He joined the Brotherhood of Locomotive Firemen and five years later became its grand master. In the union he possessed a wide influence, advocating always the rights of labor and at the same time law and order, moderation, and conciliation. In the railway strikes of 1892–94 he had great influence. President McKinley appointed him a member of the Industrial Commission and proposed to make him chief of the Bureau of Engraving and Printing. He declined this post but from 1902 till his death was Commissioner General of Immigration.

SARGENT, John Singer (1856–). One of the most eminent of modern portraitists; also a distinguished painter of figures and landscapes. He was born of American parents in Florence, Italy, Jan. 12, 1856. He took a course of classical studies at Florence, where he was also enrolled as a pupil of the Academy, and as a youth made studies of the old masters. After extensive travels with his parents he became, at the age of 18, the pupil of Carolus Duran in Paris. He speedily acquired many of his master's best qualities, assisting him in his decoration of the Luxembourg, into which he introduced Duran's portrait. Among his first exhibited pictures "En route pour la pêche" (1878), a group of fisher girls upon the beach, and "Neapolitan Children Bathing" (1879) attracted much attention. Charming souvenirs of his visit to Spain in 1879 and of the influence of Velazquez are the "Smoke of Ambergris" (1880) and "El Jaleo" (1882, Boston Museum), a Spanish dance. He continued to reside in Paris, exhibiting yearly at the Salon, until

1884. Thereafter he made his home in London, where he speedily became one of the most famous portrait painters of the day. He received the highest medals and honors, including the Grand Prix at the Paris expositions of 1889 and 1900, and the gold medal of the National Institute of Arts and Letters (U. S. A., 1914). He became a member of the National Academy of Design (New York), the Société Nationale des Beaux-Arts, the Royal Academy (London), and the American Academy of Arts and Letters, and an Officer of the French Legion of Honor. In 1887 he visited the United States, spending most of his time in New York and Boston.

Sargent's work is characterized by a very objective handling, a singular truth of vision, and readiness of hand. He viewed widely the whole field of creative art and studied with a shrewd intelligence the methods and precedents of the past. The marvelous facility of hand and vivacity of vision that characterize his work seem to be the cumulative result of the knowledge thus acquired, in conjunction with a constant and conscientious reference to nature.

Among the best of his portraits are those of Carolus Duran and Dr. Pozzi (1879); a "Young Lady" (1881); "Hall of the Four Children" (1882); "Madame Gauthereau" (1884); Lady Playfair (1885); Henry Marquand (1887, Metropolitan Museum), one of the finest modern portraits in the United States; Claude Monet (1888); Edwin Booth, Lawrence Barrett, and Joseph Jefferson, painted for the Players' Club (New York, 1890). Sargent exhibited nine works at the Columbian Exposition (1893), among which were Ellen Terry as Lady Macbeth (Tate Gallery, London), and the charming portrait of young Homer Saint-Gaudens. His other sitters include: Mrs. Carl Meyer and her children (1897); Wertheimer, the London art dealer (1898), and his daughters (1901); Col. Ian Hamilton (1899); Mrs. Ian Hamilton; William M. Chase (1902, Metropolitan Museum, New York); President Roosevelt and Secretary Hay (1903); Dr. S. Weir Mitchell; the Duchesse de S. (1905); the Marlborough family; a group of four professors of Johns Hopkins University (1907); Henry James (1913), destroyed by suffragettes.

Besides portraits, Sargent painted figure pieces, like "Carnation Lily, Lily Rose" (1885, Tate Gallery) and "Carmencita" (1891, Luxembourg), of the highest order. The Metropolitan Museum, New York, possesses three, all in his most modern style: "Gitana," "Padre Sebastiano," and the strange "Hermit" (1910). His mural decorations in the Boston Public Library rank with the best work of the kind. After elaborate studies in Egypt and elsewhere, he completed in 1892–94 mural decorations for one end of the great hall now named for him in the Boston Public Library. His success was so great that his commission was extended to include the entire hall. As part of his general scheme, he depicted the "Pageant of Religion" —the triumph of monotheism over the polytheism of the ancient world—in weird allegorical representations, even making use of relief. Particularly impressive are the figures of the Hebrew Prophets upon the side walls, in which he has created truly monumental types. The decorations of the opposite end of the hall, completed in 1903, represent the "Dogma of the Redemption," with recourse to the Byzantine style. They consist of a lunette, "The Trinity," a low polychrome relief, "Christ on the Cross," and the frieze "The Angels of the Passion."

About 1909 Sargent gave up portraiture, thereafter devoting himself to landscapes and figure pieces, painted in a very modern technique and rivaling his portraits in brilliant and dispassionate naturalism. From an imposing exhibition of water colors held at London and New York in 1912, the Brooklyn Museum purchased 83 examples, the Boston Museum 45. Among his later paintings in oil are: "The Weavers" (1913); "Cypresses and Pines" (1914); "The Courtyard" (1914); "Trout Stream in the Tyrol"; "The Fountain" (Art Institute, Chicago). Consult: C. H. Caffin, *American Masters of Painting* (new ed., New York, 1913); A. G. Gardiner, *Prophets, Priests, and Kings* (new ed., London, 1914); Samuel Isham, *History of American Painting* (new ed., New York, 1915).

SARGENT, WINTHROP (1753–1820). An American soldier and pioneer, born at Gloucester, Mass. He graduated at Harvard in 1771 and during the Revolutionary War served in the patriot artillery, rising to the rank of major. After the war he became interested in Western land schemes, and, having been employed by Congress as a surveyor in what was afterward the Northwest Territory, he was in 1786 elected one of the two delegates from Suffolk County in Massachusetts chosen to aid in forming the Ohio Company. After its organization he was chosen secretary and in conjunction with Manasseh Cutler (q.v.) purchased land on its behalf. The next year Congress appointed him Secretary of the Territory. In 1798 he was appointed Governor of Mississippi Territory and took up his residence at Natchez. He died while on a voyage to Philadelphia. With B. B. Smith he published *Papers Relative to Certain American Antiquities* (1776), and in 1803 he published a poem entitled *Boston.*

SARGENT, WINTHROP (1825–70). An American author and lawyer, born in Philadelphia. He graduated at the University of Pennsylvania in 1845 and at the Harvard Law School in 1847 and later settled in New York City. He devoted much of his time to historical research and published works dealing with the Colonial and Revolutionary periods, including *History of an Expedition against Fort Duquesne in 1755, Under Major-General Edward Braddock* (1855); *Life and Career of Major John André* (1861; new ed., 1902); *The Loyal Verses of Joseph Stansbury and Dr. Jonathan Odell* (1860); *Loyalist Poetry of the Revolution* (1860).

SARGON, sär'gŏn (Heb.; Bab. *Shargani* and *Sharrukin;* Assyr. *Sargani, Sarru kinu,* rightful ruler). The name of several Babylonian and Assyrian kings.—SARGON I, founder of the dynasty of Agade and of an empire lasting 197 years. His name heads the list of 12 kings of this dynasty published by Scheil, and he was said to be a priest of Zamama, the god of Kish; the next four names are missing, and the last seven given. A large tablet from Nippur, now in Philadelphia, informs us that Sargon captured Lugalzaggisi, styled himself both "lord of Kish" and "lord of Accad," and was followed by Rimush and Manishtusu. These kings cannot therefore, as had been supposed (see BABYLONIA), belong to the dynasty of Kish preceding Lugalzaggisi, but Sargon must have revived the ancient title which implied a claim to

power over all Babylonia. From the omen tablets, the Chronicles, and other inscriptions we learn that he undertook many campaigns, conquered the Elamites, took possession of Mesopotamia (Subartu), subdued the Amorites in Syria, and went with his army as far as to the island of Tilmun (Tylos, Bahrein) in the Persian Gulf, and "beyond the sea of the setting sun," probably to Cyprus. Towards the end of his reign "all lands rebelled against Sargon and besieged him in Accad, but Sargon went out against them and destroyed their great army." He was succeeded by his son, apparently Rimush. Consult L. W. King, *A History of Sumer and Akkad* (New York, 1910), and Eduard Meyer, *Geschichte des Altertums* (3d ed., i, 2, Stuttgart, 1913).—SARGON II, King of Babylonia. Strong reasons have been adduced by Thureau-Dangin and Eduard Meyer for believing that the four names missing in Scheil's list of the Accad dynasty are Rimush, Manishtusu, Sargon (Sharganisharri), and Naram Sin. A number of tablets dated in the regnal years of Sargon II and his son Naram Sin (q.v.) have been found at Telloh, the ancient Lagash. Mention is made of a struggle with Uruk and Naksu, consequently a Sumerian rebellion, in the time of Sargon II, an attack by the Elamites on Opis which was repulsed, a victory over the Amorites at Basar, and a conquest of the Gutians and capture of their King, Sharlak. As his father, Itti Ellil, is not said to be King, Sargon II is likely to have been a usurper. In later times he seems to have been confused with Sargon I, and it is not clear to which of them the mythical story of exposure in an ark on the river as an infant was originally applied. If Nabunaid's statement is correct, he reigned before 3750 B.C. Its accuracy has been questioned by some scholars, but the contentions for a much later date are not supported by any evidence.—It is not certain that there was a SARGON III, of Accad, son of Naram Sin. Consult Eduard Meyer, *l. c.*—SARGON I, of Assyria (c.2175 B.C.). He was the son of Ikunum, grandson of Irisum, and reigned as priest king, or *patesi*, of the god Asir, at Assur, over an empire which extended into Asia Minor, as is evident from one of the Cappadocian tablets. Consult Sayce, in *Babyloniaca*, iv (Paris, 1911).—SARGON II, of Assyria (722–705 B.C.). He was a usurper, probably raised to the throne by priestly influence. In the battle of Durilu he was defeated by Humbanigash of Elam and the Chaldæan Mardukapaliddin, and the latter reigned for 12 years in Babylon (721–709). He claims to have captured Samaria, but this was probably done by Shalmaneser V in 723, as the biblical accounts and the Babylonian Chronicles indicate. He took Hamath in 720, quelled an insurrection in Samaria, defeated Hanun of Gaza, and won the battle of Raphia against the Egyptians. He carried away from Samaria 27,290 Israelites to Mesopotamia and Media. In 717 he captured Carchemish and in 715 invaded Arabia, whence he brought a large number of people whom he settled in Samaria. In 714 he conducted a campaign in western Iran, Armenia, and Kurdistan, according to a recently found inscription. An insurrection in Ashdod in 711 was quelled by his *turtanu*, or commander in chief. Babylonia was conquered in 709. Wars were also fought with the Chaldians (q.v.) in Armenia, with Melitene, Commagene, Cilicia, Cappadocia, and Ellip. Sargon built a splendid palace in his new capital, Dur Sargon, the modern Khorsabad. He appears to have fallen in a battle with the Cimmerians in Cappadocia. Consult A. T. Olmstead, *Western Asia in the Days of Sargon of Assyria* (New York, 1908), and F. Thureau-Dangin, *Une relation de la huitième campagne de Sargon* (Paris, 1912).

SARK, särk, or **SERCQ**. The fourth in size, but most picturesque, of the Channel Islands (q.v.), 6 miles east of Guernsey (Map: France, N., C 3). It consists of Great and Little Sark, connected by the Coupée, a natural causeway, 150 yards long, 15 feet broad, and 384 feet high. Area, 2 square miles. Pop. (1911), 534; Little Sark, 45.

SAR'KIN. See HYPOXANTHINE.

SARMATIANS, sär-mā'shanz. An ancient tribe who in the time of Herodotus (fifth century B.C.) lived between the Caspian Sea, the Don, and the Sea of Azov. Later they subdued the Scythians of the great plains north of the Black Sea, to which the name of Sarmatia was extended. Here they remained till overpowered by the Goths (q.v.) and the Huns (q.v.). They spoke the same language as the Scythians and are now thought to have been one of a group of tribes of which the Scythians are the best known. Herodotus describes some of the ancient tribes of the Don as semicivilized, while others were in the lowest stage of barbarism. Remains of the Sarmatians have been found in the burial mounds in their former habitat, and it is supposed by some that they were the ancestors of the Slavs (q.v.). Among the Sarmatian tribes were the Roxolani (q.v.) and the Jazyges (q.v.).

SARMIENTO, sär'mē-ān'tō, DOMINGO FAUSTINO (1811–88). An Argentine educator, author, and statesman, born at San Juan. He began his career as a teacher at San Luis. For opposing Rosas he was compelled to flee about 1830 to Chile. He returned to San Juan in 1836, established a school there for girls, and edited a literary paper, but was imprisoned on a political charge and forced once more to go to Chile. There he devoted himself to the question of public instruction, founded the first normal school in South America, and in 1845 was sent by the Chilean government to visit the educational institutions of Europe and the United States, where he came under the influence of Horace Mann (q.v.). After 1847 he acted as the editor of several journals. In 1851 he returned to the Argentine Republic and fought in the war against the dictator Rosas. To him was due the establishment of a Department of Public Instruction, of which he became Minister in 1860. In close succession he filled the offices of Minister of Interior, Governor of San Juan, Minister to Chile, and finally Minister to the United States from 1865 to 1868, when he was chosen President of the Argentine Republic. His administration was devoted to securing progress in education, extension of railways, greater respect for law and order, and development of commerce and industry. Among his important works are: *Civilización y barbarie, ó Facundo Quiroga y Aldao* (1845); *Arjirópolis, ó la capital de los Estados Confederados del Río de la Plata* (1850); *Viajes por Europa, Africa y América* (1849–51); *Comentarios de la Constitución de la Confederación Argentina* (1853). The results of his sojourn in America were his *Vida de Abrahán Lincoln* (1866) and *Las escuelas, base de la prosperidad en los Estados Unidos* (1869).

His *Obras* are published in 53 volumes (Paris and Buenos Aires, 1889–1909).

SARMIENTO DE GAMBOA, dā gäm-bō'ä, PEDRO (c.1530–87). A Spanish navigator, born at Pontevedra. He was sent in 1579 from Callao in Peru with a small fleet to intercept Drake, then cruising along the coasts of Peru and Mexico, and further to explore the Strait of Magellan. On his return to Spain in 1580 he gave King Philip a description of the locality, which decided him to fortify it as a stronghold, and a year afterward Sarmiento and Diego Flores Valdez were sent there in charge of a large expedition. Sarmiento established a colony at San Felipe, now known as Port Famine, but on his way back to Spain he was captured by the English. He left an *Atlas* of 14 maps and a *Relación* of his voyage to the Strait of Magellan.

SAR'NIA. A city, port of entry, and the capital of Lambton County, Ontario, Canada, at the mouth of the St. Clair River and on the Grand Trunk and Pere Marquette railroads, opposite Port Huron, Mich., connecting by a car ferry and by a railroad tunnel beneath the river (Map: Ontario, C 8). Industrial establishments include oil refineries, saw mills, salt works, bridge works, and manufactories of woodwork, stoves, threshers, brass goods, cream separators, etc. Pop., 1901, 8176; 1911, 9947.

SARNO, sär'nō. A city in the Province of Salerno, Italy, situated on the Sarno, 12 miles by rail northwest of Salerno (Map: Italy, E 4). The city is dominated by the ruined castle of Count Francesco Coppola. Paper, silk, cotton, linen, and hempen fabrics are manufactured. The chief products are grain, olives, grapes, and sulphur. Sarno was a countship before it was incorporated with Naples. Near Sarno occurred a battle in 553, in which Narses defeated the Goths and ended their reign in Italy. Pop., 1911 (town), 15,130.

SAROLACTIC ACID. See LACTIC ACID.

SAROLEA, sä'rō-lā', CHARLES (1870–). A Belgian educator, born at Tongres. He was educated at Liége University, from which he received in 1892 a scholarship enabling him to spend two years traveling in Europe, in the Near East, in Africa, and in America. In 1874 he became first lecturer and head of the French and Romance department in the University of Edinburgh, and from 1901 served also as Belgian Consul at Edinburgh. Various honorary degrees and decorations were conferred on him. His writings, variously in French and English, include: *Ibsen* (1891); *La liberté et le déterminiseur* (1893); *Essais de philosophie et de littérature* (1898); *The Russian Revolution* (1905); *The Balkan Question* (1906); *Essais de littérature et de politique* (1906); *Cardinal Newman and his Influence on English Religious Thought* (1908); *Victor Hugo* (1911); *Life of Tolstoy* (1912); *The Anglo-German Problem* (1914); *How Belgium Saved Europe* (1915). He was also editor of the Collection Nelson and the Collection Gallia. Sarolea was an accomplished linguist, and collected a notable library of some 60,000 volumes.

SARON'IC GULF (Lat. *Saronicus Sinus*). See ÆGINA; ÆGINA, GULF OF.

SARPE'DON (Lat., from Gk. Σαρπήδων). 1. The son of Zeus and Europa, King of the Lycians. His father gave him the privilege of living through three generations. 2. A Lycian prince, the grandson of the preceding, or, according to some, the son of Zeus and Loadamia. Homer represents him as an ally of the Trojans, distinguished for courage and slain by Patroclus. Apollo rescued and purified his body and had it transported into Lycia for burial.

SARPI, sär'pē, PAOLO (1552–1623). An Italian historian and supporter of the Reformation. He was a Venetian by birth. He entered the Servite Order at the age of 13, taking the name of Fra Paolo. He taught theology and philosophy, and studied other sciences, making discoveries in anatomy. He was ordained priest and in 1579 became provincial of his order. He returned to Venice in 1588, but his intimate relations with the opponents of the Church caused suspicion of his orthodoxy, and three applications for a bishopric were refused. On the outbreak of the conflict between the Republic of Venice and Paul V he threw himself into the antipapal party, and became the official counselor of the Republic in ecclesiastical matters. Under his advice Venice banished the Jesuits. In 1606 he was summoned to Rome to appear before the Inquisition, but refused to obey. He maintained his relation with Protestant leaders, and began his *History of the Council of Trent*, which gives him his greatest fame, though it is colored by his violent prejudices. It was published in London (1619) by Marcantonio de Dominis and at Geneva (1629), probably by Diodati. Consult: T. A. Trollope, *Paul the Pope and Paul the Friar* (London, 1861); A. Robertson, *Fra Paolo Sarpi, the Greatest of the Venetians* (ib., 1894); Rein, *Paolo Sarpi und die Protestanten* (Helsingfors, 1904); A. D. White, in *Seven Great Statesmen in the Warfare of Humanity with Unreason* (New York, 1910).

SARPSBORG, särps'bôrg. A town of the Province of Smaalenene, Norway, on the right bank of the Glommen, 68 miles by rail south-southeast of Christiania. Its port on the Christiania Fiord is Sannesund. To the north lies the Lake of Glengshölen; to the east are the immense falls of the Glommen, Sarpfoss, 140 feet broad and 74 feet high. The town owes its importance to this natural power for mills. There are calcium carbide, wood pulp, paper, aluminium, spinning, weaving, and saw mills. Pop., 1900, 6922; 1910, 9697. Sarpsborg was founded in 1016 and was destroyed by the Swedes in 1567. The new town dates from 1840.

SAR'RACE'NIA, SIDESADDLE FLOWER, or PITCHER PLANT. A genus of singular marsh plants, natives of North America. *Sarracenia purpurea* is common from Hudson Bay to Florida; the other species, of which there are four or five, are confined to the Southern States. They are perennial herbs with radical leaves which are transformed into pitchers (*Sarracenia flava* has its leaves prolonged into trumpets) and scapes, which bear one or more large flowers. The genus is the type of the small family Sarraceniaceæ, of which the other genera are *Heliamphora*, which has been discovered in Guiana, and *Darlingtonia* in California. All the species are insectivorous. Consult Charles Darwin, *Insectivorous Plants* (new ed., New York, 1900). See CARNIVOROUS PLANTS.

SAR'RACE'NIA'CEÆ. See SARRACENIA.

SARRAIL, sä'rä'y', MAURICE (?–). A French soldier. He had held various commands before 1913, when he was in charge of an infantry division in the Sixth Army Corps at Rheims. When the European War broke out in 1914, he

was placed in command of the troops in the Argonne. It was he who held the lines before Verdun against the German Crown Prince's army, while the other French armies won the victory of the Marne. In August, 1915, when Gen. H. J. E. Gouraud was incapacitated, Sarrail succeeded him as commander in chief of the French forces at the Dardanelles. Later in the same year he commanded the expeditionary army landed at Saloniki for service in Servia. See WAR IN EUROPE.

SARRAU, sä'rō', JACQUES ROSE FERDINAND EMILE (1837–1904). A French physicist and engineer, born in Perpignan and educated in Paris at the Ecole Polytechnique. In 1878 he became director of the central depot for saltpetre and powder, was named chief engineer in 1879, became professor of mechanics in the Polytechnic in 1883, was elected to the Academy of Sciences in 1886, and in 1897 was promoted to the rank of inspector general. Sarrau's especial study was explosives. In physics his main research was on the compressibility of gases (Paris, *Comptes Rendus*, 1882 et seq.), and he determined the critical point of oxygen. Among his writings are *Recherches théoriques sur les effets de la poudre et des substances explosives* (1874–75); *Introduction à la théorie des explosifs* (1893); *Théorie des explosifs* (1895).

SARRIEN, sä'ryăN', JEAN MARIE FERDINAND (1840–1915). A French statesman, born at Bourbon-Lancy (Saône-et-Loire). He studied law, practiced at Laon, fought in the war against Germany, and in 1876 was elected to the Chamber of Deputies. He held the portfolios of Posts and Telegraphs under Brisson (1885), the Interior under Freycinet (1886), Justice under Goblet (1886–87), the Interior again under Tirard (1887–88), and Justice again under Brisson (1898). He became Premier and Minister of Justice in March, 1906, but retired in October. In 1908 he was elected Senator from Saône-et-Loire to fill a vacancy and the next year was reëlected.

SARRUS'OPHONE. A brass instrument with a double reed, built in various sizes and pitches covering a range from $_1E\flat$ to $d\flat^2$. It is named after its inventor, Sarrus, a French bandmaster. Outside of French bands these instruments are little used, although the contrabass member of the group is especially fine, and undoubtedly superior to the contrabassoon.

SARS, särs, GEORG OSSIAN (1837–). A Norwegian zoölogist, brother of Johan Sars and brother-in-law (through his sister's marriage) of Nansen the explorer. He was born in Kinn. Educated at Bergen and at Christiania University, he studied medicine and zoölogy and won the King's gold medal for a treatise on Crustacea (1862). For the government he studied the cod fisheries and Lofoten fisheries (1864–73), and from 1873 to 1893 he was engaged in carrying out improvements in all the sea fisheries of Norway. He was made professor of zoölogy at Christiania (1874), visited great universities abroad (1875–76), studied sea fauna at Naples, and was a member of the North Sea expedition (1876–78), planned by Sars and Prof. H. Mohn, and helped to edit the results. He published more than 100 works on Crustacea, Mollusca, cod, and whales, with illustrations by himself. His main work is *An Account of the Crustacea of Norway* (1895 et seq.; 5 vols. and 4 parts of vol. vi ready in 1915), considered the greatest work in existence on the subject.

SARS, JOHAN ERNST WELHAVEN (1835–). A Norwegian historian, brother of Georg Sars, born in Kinn and educated at Bergen and at Christiania University. He entered the state archives (1860) and was appointed professor of history in Christiania University (1874). Influenced by Auguste Comte and Herbert Spencer, he wrote *Norge under Foreningen med Danmark, 1537–1814* (1858–65), followed by *Udsigt over den Norske Historie* (4 vols., 1873–91), a most important work on the history of Norway. He exerted a marked influence upon the political life of Norway by his lectures, by his fugitive writings, by editing periodicals, as *Nyt Norsk Tidsskrift* and *Nyt Tidsskrift*, by his *Historisk Indledning til Grundloven* (1882; 3d ed., 1884), and by *Norges Politiske Historie, 1815–85* (1899–1904). Of *Norges Historie* by Bugge, Sars, and others (8 vols., 1909–13) he wrote vol. vi. He also published *Folkemængdens Bevægelse i Norge fra 13de til 17de Aarhundrede* (1882) and contributed to Gerhard Gran's *Nordmænd i det 19 de Aarhundrede* (3 vols., 1915) and to Brögger and Getz's *Norge i det 19 de Aarhundrede* (2 vols., 1900). His *Samlede Skrifter* appeared in 6 volumes (1912–13).

SARSAPARIL'LA (Sp. *zarzaparilla, zarzaparrilla*, from *zarza*, bramble, from Basque *sartzia*, bramble + **parilla*, trained vine). A medicine which is the product of several species of Smilax (see SMILACEÆ), *Sarsaparilla officinalis, Sarsaparilla medica*, and other undetermined varieties. They are woody vines with prickly angular stems—the first with large ovate-oblong, acute, heart-shaped, leathery leaves; the second with shortly acuminate smooth leaves, the lower ones heart-shaped, the upper ones approaching to ovate. The shrubs are natives of warm parts of America.

The part of the plant used in medicine is the dried roots, which are of about the thickness of a goose quill, generally many feet in length, reddish brown, covered with rootlets. They are folded in bundles about 18 inches long, are scentless, taste mucilaginous, slightly bitter, faintly acrid. Sarsaparilla was formerly considered a diaphoretic, diuretic, and alterative and was used extensively, especially in syphilis and rheumatism. It is now known to be practically inert, and aside from its use as a vehicle for potassium iodide in the form of the compound sirup of sarsaparilla it is chiefly employed in "spring medicines," which are harmless, and profitable to their makers. See SMILAX.

SARSAVATI. The name of a sacred river worshiped as a goddess in Vedic literature. Towards the end of the Vedic period Sarsavati became identified with Vac (speech). See VAC.

SAR'SEE', or **SARSI.** A small detached tribe of Athapascan stock (q.v.), settled upon a reservation at Calgary, Alberta, Canada. When first discovered they were living under the protection of the Blackfoot (q.v.) Indians, whom they resemble in culture. Consult McLean, *Canadian Savage Folk* (Toronto, 1896), and Goddard, in American Museum of Natural History, *Anthropological Papers*, vol. xi, part 5 (New York, 1914).

SARS'FIELD, PATRICK, EARL OF LUCAN (1645–93). An Irish Jacobite soldier. He was born at Lucan (near Dublin), received a military education in France, entered the English army, and rose to the rank of colonel in 1686. He served under Monmouth in France, but was in the victorious army when Monmouth was de-

feated at Sedgemoor. He was a Roman Catholic and at the revolution was a member of Parliament. He supported King James II in his effort to retain the crown, accompanied him to France and thence to Ireland, and fought at the battle of the Boyne. William III was forced by him to raise the siege of Limerick in 1690. In 1691 he commanded the reserve at Aughrim and after a gallant defense of Limerick obtained fair terms of surrender and was allowed to retire to France, where he became maréchal de camp in the French service. He distinguished himself at the battle of Steenkirke in 1692 and at Neerwinden in 1693, where he was wounded, dying shortly afterward.

SARTAIN, sär-tān', JOHN (1808–97). An English engraver and editor, active chiefly in America. He was born in London, studied line engraving under John Swain, and while yet a lad illustrated Ottley's *Early Florentine School* (1826). In 1828 he began to practice mezzotint, which he was the first to introduce into America. In 1830 he emigrated to Philadelphia, where he developed a prodigious activity, not only in his profession, but as editor of two magazines and in serving as a member and councilor of many societies of art. As an engraver he has left works of value. Three of the largest and most important plates are "Christ Rejected" (1862), after Benjamin West, "The Iron-Worker and King Solomon" (1876), after Christian Schüssele, and "John Knox and Mary, Queen of Scots," after Leutze. Among others are those of Penn and Martin Van Buren, after Inman, Henry Clay, after John Neagle, Horace Binney, after Sully, and, especially, two large portraits of Robert Gilmour and Lawrence, after Lawrence himself. Sartain also practiced portrait painting in oil and miniature painting on vellum and ivory, though with less success, and designed several public monuments, the principal of which is the Washington and Lafayette Monument in Philadelphia.

His daughter, EMILY SARTAIN (1841–), mezzotint engraver, etcher, and portrait and genre painter, was born in Philadelphia. She studied with her father and at the Pennsylvania Academy, under Schüssele, and with Luminais in Paris. She engraved a number of framing prints, besides many portraits for book illustrations. Her painting "Reproof" (1876) gained a medal at the Centennial Exposition. From 1881 to 1883 she was editor of *Our Continent*, and after 1886 she was principal of the Philadelphia School of Design for Women.

SAMUEL SARTAIN (1830–1906), engraver on steel, son and pupil of John Sartain, was chiefly engaged in engraving portraits and other plates for book illustration. His prints include "Clear the Track," after Christian Schüssele (1854); "Christ Blessing Little Children," after Sir Charles Eastlake (1861); the "Song of the Angels," after Thomas Moran; and various portraits after Thomas Sully, John Neagle, and others. Consult John Sartain, *Reminiscences of a Very Old Man* (New York, 1899), and Frank Weitenkampf, *American Graphic Art* (ib., 1912).

SARTAIN, WILLIAM (1843–). An American landscape and genre painter. He was born in Philadelphia, the son of John Sartain the engraver, with whom he worked until 1867. From 1867 to 1869 he studied under Christian Schüssele, at the Pennsylvania Academy, and later in Paris under Yvon and Bonnat. After sketching in Italy, Spain, and Algiers he exhibited at the Royal Academy, London, in 1875, returning to the United States in the following year. He made New York his residence, but spent each summer in Paris. Sartain became professor of the life class of the Art Students' League, New York City, and an associate of the National Academy (1880), and was one of the original members of the Society of American Artists. His paintings, though not brilliantly executed, are characterized by good tonal qualities. His scenes from Algerian life are well known. Among the best examples of his work are an "Italian Head" (1876); "Narcissus" (1878); "Lucia, Near Algiers"; "Street in Dinan, Brittany" (Corcoran Art Gallery, Washington); "Outside Mosque, Algiers," "A Chapter from the Koran" (Metropolitan Museum, New York); "Algerian Water Carriers" (National Gallery, Washington). "In the Hackensack Valley," "The End of Day," "A Sudden Shower" (1904), and "The Edge of the Sheep Pasture" (1904) are among his landscapes. Sartain is also known as an etcher of portraits in mezzotint.

SARTHE, särt. An inland department of northwest France, north of the Loire (Map: France, N., F 5). Area, 2411 square miles. Pop., 1911, 419,370. It is a region of plains traversed by low hills and by undulations and watered by the river Sarthe. Agriculture is the leading industry; mining and manufacturing are also important. Capital, Le Mans.

SARTO, sär'tô, ANDREA DEL (1487–1531). A Florentine painter of the high Renaissance, the greatest colorist of the school. He was born at Gualfondo, near Florence, July 16, 1487, the son of Angelo, a tailor (sarto), whence the name usually given him. In 1504 his father went to Florence and apprenticed his son to a goldsmith. The lad's talent having attracted the attention of Giovanni Basile, a local painter, the latter instructed him, afterward placing him with Piero di Cosimo. Andrea was influenced to a greater extent by Fra Bartolommeo. In the Sala del Papa he met Franciabigio (q.v.), with whom he was associated until about 1512. In 1508 he became a member of the Painters' Guild, and in 1513 occurred his supposedly disastrous marriage with Lucretia del Fede, the beautiful young widow of a hatmaker.

Vasari's account of this lady has taken strong hold of the popular imagination—witness Browning's celebrated poem—and is accepted even by biographers. We are told that she was the evil genius of his life, hindering his work, racking him with jealousy, wasting his substance. There is, however, no evidence confirmatory of Vasari's statements; whatever there is, goes to disprove them. His dislike was, perchance, due to the blows which he tells us the vixenish lady was wont to inflict upon her husband's pupils, of whom Vasari was one.

Before his journey to France Andrea was considered a famous painter and had been intrusted with important fresco commissions, which he completed after his return to Florence. In these frescoes his progress as an artist may best be traced. In Santa Annunziata, the church of the Servites, he painted (1509–14) seven of the 10 frescoes in the cloister. Five are scenes from the life of Filippo Benozzi, founder of the order; but the finest are the "Adoration of the Kings" (1511), and especially the "Birth of the Virgin" (1514), which, although the composition is imitated from Ghirlandaio, shows all of Andrea's best qualities. In the lunette over the entrance

ANDREA DEL SARTO

"MADONNA OF THE HARPIES," FROM THE PAINTING IN THE UFFIZI GALLERY, FLORENCE

to the cloister he painted the celebrated "Madonna del Sacco," in reality a "Holy Family," and so called from the sack of corn upon which Joseph sits reading to the beautiful and dignified Madonna. This picture is the acme of Andrea's coloristic production in fresco. Another famous series of 10 scenes from the life of John the Baptist, in the cloister of the Scalzi, was executed in brown monochrome (1511–26). The absence of color in this work incited the artist to display his great gifts of composition and narrative power. In the refectory of the convent of San Salvi he painted, besides earlier panels, his celebrated fresco of the "Last Supper," the only representation of the subject worthy to be compared with Leonardo's. He has chosen the moment subsequent to that depicted by Leonardo, when Christ and Judas dip their bread into the dish. Less monumental and impressive than his predecessor's, his representation is fresh in treatment, brilliant and soft in color. The former's celebrated portrayal of the action by means of the hands is almost equaled by his follower.

Andrea's easel pictures may best be studied at Florence. Among those in the Pitti Palace are the "Annunciation" (1512), "Disputa," two "Holy Families" (1523 and 1529), a large "Pietà," the "Adoration of the Virgin," the "Story of Joseph," and several portraits, including one of himself and wife, also ascribed to Franciabigio. The best known in the Uffizi are "Madonna of the Harpies" (see MADONNA), "St. James Caressing Little Children," two portraits of himself, and one presumably of his wife. In the Academy of Florence is a picture of stately saints; and in the cathedral of Pisa, Saints Catharine, Margaret, and Agnes are among the most charming female figures Andrea ever painted. Dresden possesses "Abraham's Sacrifice" (replica at Madrid); the Louvre, his "Charity" and a "Holy Family"; Berlin, a portrait of his wife and a "Madonna with Saints" (1528); and London, the portrait of a sculptor.

Andrea died of the plague, Jan. 22, 1531. He was far the greatest colorist south of the Apennines, and his works will bear comparison with those of the great Venetian masters. Silvery in the frescoes and tending towards gold in easel pictures, his colors are always clear, luminous, and harmonious. He was an accomplished chiaroscurist, and in line he was second only to Michelangelo and Leonardo. His drawings, of which the best collections are in the Louvre and the Uffizi, are often essentially modern in character. Such technical merits, indeed, made him deserving of the title the "Faultless Painter"; he only lacked that sense of the truly significant possessed by the greatest geniuses. The effect of his work is often interfered with by the use of too much statuesque drapery.

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SARTO, GIUSEPPE. See PIUS, *Pius X.*

SARTORIUS VON WALTERSHAUSEN, sär-tō'rē-ụs fôn väl'tẽrs-hou'zen, AUGUST, BARON (1852–). A German economist, born in Göttingen. He was educated in the University of Göttingen, became professor at Zurich in 1885, and in 1888 was called to a chair of economics in Strassburg. His principal works deal with American economic and industrial problems and include: *Die Zukunft des Deutschtums in den Vereinigten Staaten* (1885); *Nordamerikanische Gewerkschaften* (1886); *Moderner Sozialismus in den Vereinigten Staaten von Amerika* (1890); *Arbeitsverfassung der englischen Kolonien in Nordamerika* (1894); *Handelsbilanz der Vereinigten Staaten von Amerika* (1901). He also wrote, among other works, *Das Volkswirtschaftliche System der Capitalanlage im Ausland* (1907).

SARTOR RESARTUS, sär'tor rē-sär'tŭs. See CARLYLE, THOMAS.

SARTS. The term denoting the settled (farming and commercial) population of certain regions of Turkestan, Persia, and Afghanistan, as opposed to the nomadic. It has more of a topographical than of an ethnological significance, being applied sometimes to the Tadjiks, who are Aryans, and at others to the Uzbegs, who are of Turkic stock.

SA'RUM, OLD. A former city and borough and now a parish in Wiltshire, England, on a hill 2 miles to the north of Salisbury (q.v.). It dated from the time of the Romans, by whom it was known as Sorbiodunum, and remained an important town under the Saxons. A Witenagemote was held at Old Sarum in 960, and here William the Conqueror assembled all the barons of his Kingdom in 1086. In 1220 the cathedral was removed to New Sarum, now Salisbury (q.v.), and was followed by most of the inhabitants. In Henry VII's time it was almost wholly deserted. Traces of walls and ramparts and of its cathedral and castle are still seen. Though without a house, two members represented it in Parliament till Old Sarum became proverbial as the type of a rotten borough. It was disfranchised by the Reform Bill of 1832. William Pitt, Earl of Chatham, first sat in Parliament for Old Sarum in 1735. Pop. (parish), 274.

SARUM, NEW. See SALISBURY.

SARZANA, särd-zä'nȧ. A city in the Province of Genoa, Italy, on the Magra, 8 miles by rail east of Spezia (Map: Italy, C 2). The Gothic cathedral, begun in 1355, is rich in paintings and marbles. The ancient citadel is used as a prison. There are a seminary and a technical school. Sarzana has manufactures of silk and glass; wine and olive oil are made. Pop. (commune), 1901, 12,141; 1911, 14,532 (town, 6507).

SASINE. See INFEFTMENT AND SASINE.

SASKATCHEWAN. A province of Canada, constituted in 1905 by the Dominion Parliament out of the eastern half of the former District of Athabasca and the larger part of the former districts of Assiniboia and Saskatchewan. It lies between long. 102° and 110° W. and between lat. 49° and 60° N. Its area is 251,700 square miles, of which 8138 square miles are under water.

Geologically the province is a drift-covered region and in physical configuration is, roughly speaking, a vast plain, rising gradually from east to west, with gently rolling prairie, broken at intervals by groups of well-wooded hills, espe-

cially along the south bank of the Saskatchewan. There is an immense belt of forest rich in aspen poplar, pine, spruce, birch, and tamarack. The numerous lakes, whose origin is traced to glacial action, either by scouring out a basin or blocking drainage by deposits across the streams, include such large bodies of water as Lake Athabasca in the northwest and Reindeer Lake in the northeast. The chief waterway is the Saskatchewan River (q.v.), whose valley is famed for wheat growing. Other important rivers are the Assiniboine, which rises near the eastern border and flows into Manitoba, and the Churchill, flowing northeasterly into Hudson Bay. The winters are long and cold and the summers short and warm; but the dry and stimulating atmosphere is more endurable at a low temperature in winter than a considerably higher temperature during that season in a damp climate. The average annual precipitation is light (about 13 inches), but is greatest in the growing summer months. The snow and severe frost are a great benefit to the soil, causing the latter to retain moisture for a much longer period than usual.

Agriculture and Natural Resources. Saskatchewan has a larger and richer grain-producing area than any other Canadian province, and in wheat it ranks easily first. In 1911 there were 96,371 farms with an occupied acreage of 28,642,985; of this, 9,137,502 acres were devoted to field crops. The following table shows the acreage and production of the principal crops in 1913:

CROPS	Acreage	Production in bushels
Wheat	5,720,000	121,559,000
Oats	2,755,000	114,112,000
Barley	332,000	10,421,000
Flax	1,386,000	15,579,000
Hay and forage	62,000	114,000
Potatoes	31,000	5,138,000
Turnips	13,000	3,305,000

In 1915 the aggregate yield of wheat, oats, barley, and flax was 372,000,000 bushels. In 1914 the number of horses was 609,521; milch cows, 204,624; other horned cattle, 474,436; sheep, 126,027; swine, 454,703. The value of the dairy products was $381,809 in 1910. Agricultural education is promoted by lectures and government extension courses, experimental farms, "better-farming" special trains, and by the College of Agriculture, which is a faculty of the provincial university.

Coal, petroleum, gold, and silver are found, but the mining industry has only begun to be developed. The production of 1914 was valued at $710,840. The fisheries, though yet unimportant, promise well. Whitefish, pike, trout, pickerel, and tullibee are valuable in the order indicated. The output in 1914 was worth $148,602.

Communications. Three main transcontinental railway lines pass through the province from east to west—the Canadian Pacific, Grand Trunk Pacific (whose western terminus is Prince Rupert, British Columbia), and Canadian Northern. The railway policy has been to construct lines in advance of settlement, so that new towns and villages springing up may have ready access to market. The railway mileage was 5654 in 1914, of which 2479 miles belonged to the Canadian Pacific, 2087 to the Canadian Northern, and 1087 to the Grand Trunk Pacific. The Saskatchewan River (q.v.) is important as a means of communication. Under the government telephone system there were, in 1914, 3388 pole miles long distance and 13,714 wire miles.

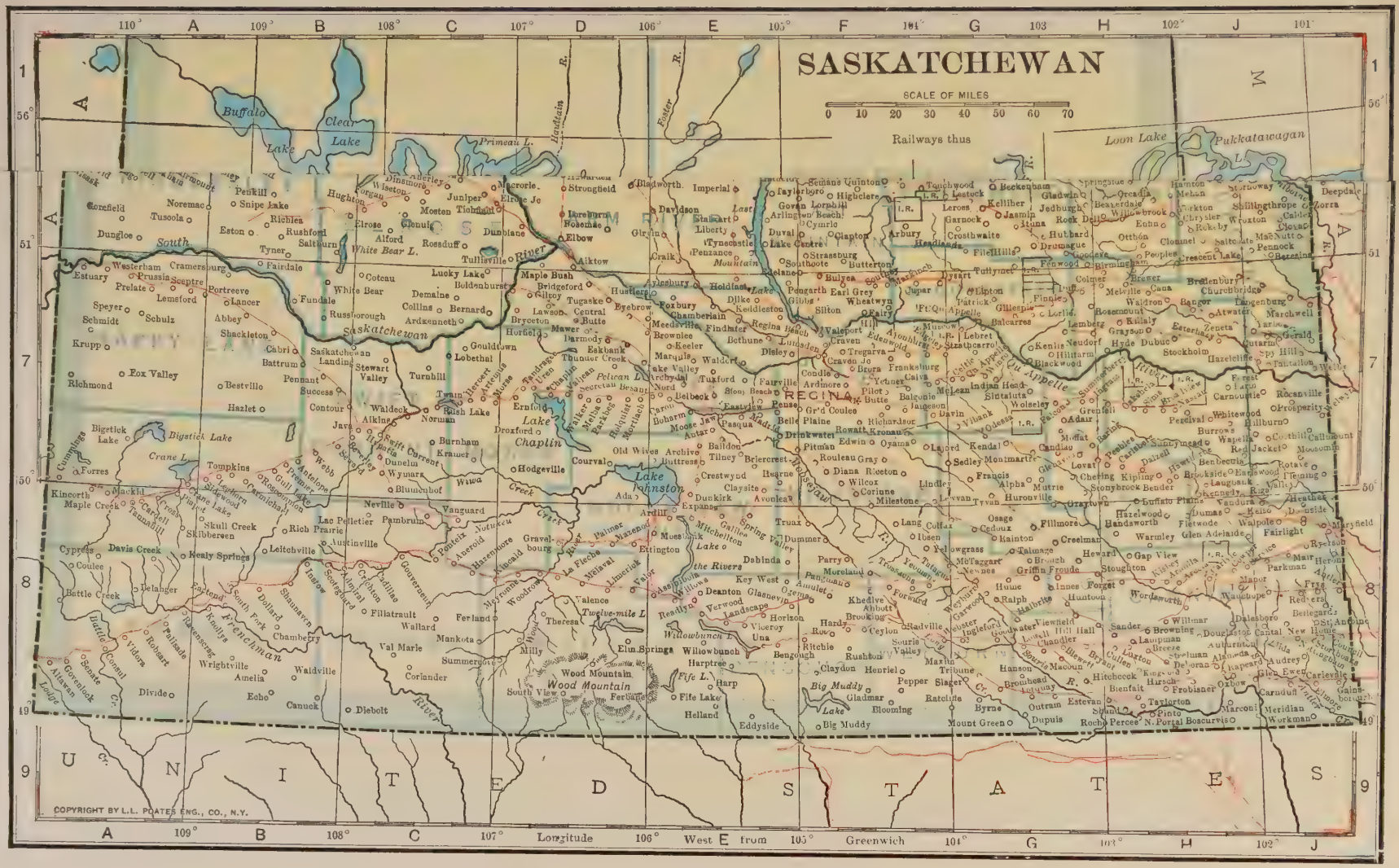
Manufactures. Manufactures are comparatively undeveloped, the energies of the people being devoted chiefly to agriculture and stock raising. In the calendar year 1910 there were 173 manufacturing establishments, with $7,019,951 aggregate invested capital, 3250 employees receiving $1,936,284 in wages and salaries, and having an output valued at $6,332,132. In 1913 there were 240 manufacturing establishments, with an invested capital of $17,306,320, employing 4258 persons, and an output valued at $16,760,779.

Education. The educational system is under the control of the Minister of Education, who is a member of the Executive Council. It is free and undenominational, though modified by federal interference in 1903. This followed the lines of the settlement of the Manitoba school question and provided that the educational rights of minorities, while not entitled to separate schools, be protected by the reservation of a half hour for religious instruction at the close of each school day.

A more recent development is the bilingual question, arising from the large immigration of foreigners who demand teachers speaking both English and their native language. A compromise was made whereby one hour of each school day was allowed for the teaching of their own language to the foreign-born. At the close of 1913 there were 3231 school districts, of which 2747 had schools in operation. The number of enrolled pupils was 99,109, with an average attendance of 54,684. The number of teachers employed was 4259, of which 1435 were males and 2824 females. There are normal schools at Regina and Saskatoon. At the head of the educational institutions is the University of Saskatchewan, situated at Saskatoon. There are also the University of Emmanuel College (Anglican), Regina College (Methodist), St. Chad's College (Anglican), the Presbyterian Theological College, affiliated with the University of Saskatchewan, and the Saskatchewan Boys' College at Moosejaw.

Government. The law-making power is vested in a Legislative Assembly of 54 members, and the executive power is a Lieutenant Governor appointed for five years by the Governor-General in Council, and advised by a cabinet, ministry, or Executive Council of seven members (of which the Premier is chief), responsible to the Assembly and retaining power by support of the majority thereof. Saskatchewan sends 16 members to the House of Commons at Ottawa and four members to the Dominion Senate. The public lands of the province, contrary to those of the older provinces, remain under control of the Dominion. In this behalf the Dominion pays the province an annual subsidy of $1,551,820.

Finances. In 1913–14 the net public debt was $18,649,395. The revenue during the 14 months ending April 30, 1914, was $6,248,956 and the expenditure $5,803,756. The chief items of revenue are the Dominion subsidy, liquor licenses, law stamps, and telephones. The chief items of expenditure are public works and improvements, education, administration of justice, and public-debt charges.


SASKATCHEWAN
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Frenchman
Wood Mountain
Buffalo Lake
Clear Lake
Primeau L.
Loon Lake
Pukkatawagan
Lake Centre
Moose Jaw Mountain
Last Mountain
Touchwood Hills
File Hills
Cypress Hills
Elbow
Outlook
Lanigan
Watrous
Imperial
Strongfield
Bladworth
Davidson
Stalkart
Liberty
Penzance
Craik
Aylesbury
Holdfast
Lake Pense
Qu'Appelle
Indian Head
Moosomin
Whitewood
Wapella
Carlyle
Arcola
Estevan
Weyburn
Moose Jaw
Swift Current
Maple Creek
Shaunavon
Gull Lake
Assiniboia
Ogema
Bengough
Milestone
Lumsden
Craven
Regina Beach
Pilot Butte
Balgonie
Davin
Lemberg
Fort Qu'Appelle
Melville
Yorkton
Esterhazy
Kamsack
Canora
Preeceville
Hudson Bay
Melfort
Tisdale
Nipawin
Carrot River
Shellbrook
Prince Albert
Duck Lake
Rosthern
Saskatoon
Battleford
North Battleford
Meadow Lake
Lloydminster
Unity
Kindersley
Rosetown
Biggar
Wilkie
Delisle
Kerrobert
Macklin
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Primrose L.
Green Lake
Jackfish L.
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Reindeer L.
Wollaston L.
Athabasca L.
Black L.
Fond du Lac
Stony Rapids
Uranium City
Lake Athabasca
Beaverlodge
Fort Chipewyan
Fort Smith
Fort Resolution
Hay River
Great Slave Lake
Great Bear L.
Great Bear R.
Mackenzie R.
Peace R.
Slave R.
Athabasca R.
Churchill R.
Saskatchewan R.
Qu'Appelle R.
Assiniboine R.
Souris R.
Red Deer R.
Battle R.
Milk R.
Frenchman R.
Big Muddy Lake
Old Wives Lake
Lake Diefenbaker
Cypress Hills
Wood Mountain
Eastend
Ponteix
Gravelbourg
Val Marie
Coronation
Wrightville
Waldeck
Norman
Kamsack
Canora
Preeceville
Yorkton
Melville
Esterhazy
Moosomin
Carlyle
Arcola
Estevan
Weyburn
Kindersley
Rosetown
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UNITED STATES
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Religion. The religious denominations in the order of their numerical strength according to the census of 1911 were: Presbyterians, 96,564; Roman Catholics, 90,092; Methodists, 78,325; Anglicans (Episcopalians), 75,342; Lutherans, 56,147; Greek Church, 24,795; Baptists, 18,371; Mennonites, 14,400.

Population. The population has increased more rapidly than that of any other Canadian province. In the former District of Saskatchewan, according to the Dominion census of 1901, there were 91,279 persons. In 1911 these numbers had increased to 492,432 in the new province, an increase of 439.48 per cent. Of the total population in 1911, 291,730 were males and 200,702 females, a difference due mainly to the large number of employees on railways and public works. According to official statements the population in 1913 was 675,000. According to the report for 1914 of the Minister of Municipal Affairs Saskatchewan then had 7 cities, 71 towns, and 288 villages, with 295 rural municipalities. The chief cities with their population in 1911 were: Regina, the capital, 30,213; Moosejaw, 13,823; Saskatoon, 12,004; Prince Albert, 6254. The predominance of agriculture is shown by the fact that of the total population 361,067 were rural and 131,365 urban. The Canadian-born numbered 248,751, the British-born 77,693, immigrants from the United States 69,628, and those from continental Europe 91,104.

History. The history of the province is traced to the Hudson's Bay Company, whose charter, granted by Charles II to Prince Rupert and others in 1670, conferred trade rights and legal authority over vast regions east and west of Hudson Bay. The company's object was to create and maintain a trade monopoly, especially in furs, and to bar out settlers. In 1759 a formidable rival appeared in the Northwest Company, organized in Montreal to engage in the fur trade. The Hudson's Bay Company was compelled by competition to go inland and ultimately developed a chain of trading posts stretching from the peninsula of Labrador to the Pacific coast and from California almost to the Arctic Ocean. Fierce rivalry with the Northwest Company brought open warfare and bloodshed, ending with the absorption of the latter in 1821 by the Hudson's Bay Company. In 1817 the Earl of Selkirk, who had already purchased a controlling interest in the company, dealt a blow to the trade monopoly by establishing a settlement in the Red River valley, now the Province of Manitoba. This began the political organization of the whole vast region. The Dominion of Canada, established in 1867, naturally looked to the incorporation of the Northwest and in 1869 purchased the Hudson's Bay Company's rights therein for £300,000. (For organization and growth, see NORTHWEST TERRITORIES.) In 1905 Amédée Emmanuel Forget was appointed first Lieutenant Governor of the new Province of Saskatchewan, and Walter Scott, a Liberal, became first Premier, which office he still retained in 1915. Liberals and Conservatives in their party platforms did not greatly differ in essentials, though the Conservatives emphasized the defense of provincial rights. They also opposed Dominion control of the public lands. In educational questions, in which religious beliefs of the Catholics played an important part, the Liberals, as defenders of the educational rights of minorities, were in the main supported by the Catholic priesthood. During the Scott administration the judicial sytem was organized with a Supreme Court, a system of elevators was established for the stores of grain, a workmen's compensation law was passed, and prohibition was adopted in 1915. The outbreak of the Great War in 1914 caused considerable discontent and agitation. German members of the Legislature resigned, and partisan sentiments and arguments appeared in some German-Canadian newspapers; but the firm attitude of the government, aided by the Royal Northwest Mounted Police, was sufficient to prevent serious disturbance. A moratorium law was passed, and the province provided a large number of volunteers to assist the British government. Consult: F. J. P. Crean, *Northland Exploration* (Ottawa, 1909); Boam and Brown, *The Prairie Provinces of Canada* (London, 1914); and the *Bulletins* and *Reports* of the various government departments (Regina). See CANADA.

SASKATCH'EWAN RIVER. A river of Canada, forming with the Nelson River (q.v.), the outlet of Lake Winnipeg, one of the four great river systems of North America east of the Continental Divide (Map: Saskatchewan, J 6). It is formed by the confluence of the North and South Saskatchewan, which unite below Prince Albert in Saskatchewan Province, and flows eastward to the northwest corner of Lake Winnipeg. The main river has a length of 282 miles, and the total length, including the South Branch, is 1090 miles. The North Branch rises in the glaciers on Mount Hooker in the Rocky Mountains and flows east on the south border of the forest country through the provinces of Alberta and Saskatchewan. The South Branch has several head streams, some of which rise in the extreme northern part of Montana, and its course after leaving the mountains lies entirely within the Great Plains, flowing northeast through Alberta and Saskatchewan. Before entering Lake Winnipeg the main river flows through several lakes, the largest of which, Cedar Lake, is 30 miles long. Between Cedar Lake and its mouth it is interrupted by heavy rapids, above which it is navigable. The whole river is narrow, and the South Branch is obstructed by shoals and sand bars. Steamers ascend the North Branch to Edmonton, 850 miles from Lake Winnipeg, and smaller boats can go 150 miles farther to Rocky Mountain House.

SASKATOON, săs'kà-tōōn'. A city, port of entry, and the capital of Saskatoon District, Saskatchewan, Canada, situated on the South Saskatchewan River and on the Canadian Pacific, Canadian Northern, and Grand Trunk Pacific railways, 160 miles by rail northwest of Regina (Map: Saskatchewan, J 6). The city is the seat of the University of Saskatchewan and of an agricultural college and experimental farm. Other public buildings are the customhouse, Dominion Lands Office, Land Titles Office, two hospitals, courthouse, and opera house. The manufactures include tractors, cereals, beer, clothing, woodwork, bricks, cement blocks, cigars, metal shingles and sidings, machine-shop and foundry products, etc. Pop., 1901, 113; 1911, 12,004.

SASSABY, săs'sà-bĭ. See HARTBEEST.

SAS'SAFRAS (Sp. *sasafras*, perhaps from Lat. *saxifraga*, stone breaker, from *saxum*, rock + *frangere*, to break), *Sassafras*. A genus of trees or shrubs of the family Lauraceæ. The sassafras tree (*Sassafras officinale*, or *variifolium*)

of North America, found from Canada to Florida and west of Kansas and Texas, sometimes attains a height of 100 feet; has deciduous, entire, or three-lobed leaves, yellow flowers, and small dark-blue fruit. The wood is soft, light, coarse-fibred, dirty white and reddish brown, with a strong but agreeable smell, and an aromatic,

SASSAFRAS.

rather pungent, sweetish taste. The thick spongy bark of the root contains a volatile oil, oil of sassafras, widely used as a flavoring for confectionery. The leaves are said to be used for flavoring soups as well as for the abundant mucilage they contain.

In Australia, *Atherosperma moschata*, a tree belonging to the family Monimiaceæ, is known as sassafras. From the leaves Australian oil of sassafras is obtained.

SASSAN'IDÆ, or SASSANIDS. The last native dynasty of Persia, which ruled from about 226 A.D. until about 651. The Sassanids succeeded the Arsacidæ (q.v.) and derived their name from Sassan, the grandfather of Ardashir. Ardashir I came to the throne in 226 and reigned until 241. His father, Papak, was a princeling of Chir, not far from Istakhr (Persepolis), and obtained for his son from the Bazrangi King, Gaochithra, the position of commander in chief of Darabgerd. This position was utilized by Ardashir to secure kingly power. He extended his sway with the help of his father, who murdered Gaochithra and declared his eldest son, Shahpuhr (Sapor), King in defiance of the Parthian sovereign, Artabanus V. On Papak's death Shahpuhr was King for a short time, but, being killed while engaged in an expedition against his brother Ardashir, the latter seized the throne. He put to death all his rivals, including his elder brothers, and crowned a series of minor conquests by the defeat and death of Artabanus at Hormizdagan in 224. Two years later the capital, Ctesiphon, yielded to him. In Armenia, however, which he invaded in 228, he met with no lasting success, and in Georgia the Arsacid dynasty was able to bid him defiance. An attack on the Romans was practically futile, despite his victories at Nisibis and Carrhæ in 237.

Ardashir was succeeded by his son Shahpuhr (Sapor) I (241–272), who continued his father's policy. Undeterred by a defeat in 242 by the Roman Gordianus at Ras el Ain (Resaina), he secured by a treaty with Philippus, the successor of Gordianus, both Armenia and Mesopotamia (244). The great event of his reign was his victory over the Roman Emperor Valerian (q.v.) at Edessa in northern Mesopotamia in 260. In 261 Shahpuhr met with a reverse at the hands of Odenathus (q.v.), who took Carrhæ and Nisibis and threatened Ctesiphon itself. The invader was forced to retreat, however, and the remainder of Shahpuhr's rule was uneventful. The four following kings—Ormazd I (272–273), Bahram I (273–276), Bahram II (276–293), and Bahram III (293)—were not especially noteworthy; but Narses I (293–303), a son of Shahpuhr I, after a temporary victory over Terdat (Tiridates) of Armenia, was finally defeated by Galerius in 296, losing Armenia, Atropatene, and Iberia, which came under Roman control. Ormazd II (303–309) was followed by his posthumous son, Shahpuhr II (309–379), whose reign is one of the most important in the Sassanid period. It is marked in ecclesiastical history by bitter persecutions of the Christians begun in 342, arising from close affiliations of the Persian Christians with the Eastern Empire of Byzantium, an hereditary foe of Persia. War with Byzantium soon broke out, at first with varying success. In 345 Shahpuhr was utterly defeated at Singara. In 359 the war began anew, but, despite several victories in Armenia, the Persians made little real headway until Constantius was succeeded by Julian the Apostate (q.v.), who lost his life at Ctesiphon in 363. This victory restored to Persia all that she had lost and indirectly added Iberia and other Caucasian provinces to her sway. The success of Shahpuhr reestablished the glory of the Sassanids.

He was followed by his stepbrother Ardashir II (379–383) and his son Shahpuhr III (383–388), who lost much of Armenia Minor and was killed in a mutiny, being succeeded by his brother Bahram IV (388–399). Yazdagard I (399–420), whose reign was also marked by petty events in Armenia, but who personally was upright and peaceful, was followed by Bahram V, surnamed Gur (420–438). In the beginning of his reign he conquered the Haital (Hephthalites, or White Huns), but a persecution of the Christians involved him in a war with the Byzantine Empire, which resulted in his defeat (421). His son Yazdagard II (438–457) remained at peace with the West, but crushed the Armenian forces at Avarayr in 451. He was followed by his two sons, Ormazd III (457–459) and Firuz (459–484). The reign of the latter was marked by wars with the White Huns, against whom he made two expeditions, the first of which was unsuccessful and the second disastrous, Firuz himself being slain near Balkh. His brother Balash (Vologeses) (484–488) succeeded him, but was deposed and followed by Kavadh (Kobad) I (488–531), whose rule was interrupted for a short time by the usurpation of his brother Jamasp (496–498). In this reign Mazdak (q.v.) promulgated his doctrines, and as a result of his favor to them Kavadh was for a while deprived of his throne. He waged war with the Greeks, and at one time Belisarius (q.v.), the general of Justinian, was his opponent. He was followed by his son Khosru (Chosroes) I (531–579), surnamed Anushirvan (the immortal-souled). His reign was chiefly occupied with wars against the Byzantines. After a brief period of peace Khosru invaded Syria in 540, vexed by the successes of his rival Justinian

(q.v.) in Italy and Armenia and by his interference in Oriental politics. Belisarius, however, prevented him from doing serious injury. The second Byzantine war dragged on from 550 until 557, when it practically ended with the defeat of the Persians at Phasis near the Black Sea. In a third Greek war, begun by Justin II in 572, the Sassanid King overran Armenia, but suffered defeat in the plain of Melitene (Malitia). The Greeks then invaded Persia, and Khosru sued for peace, but died before the negotiations were completed. This reign marks the climax of the Sassanid dynasty and the golden age of Pahlavi literature.

Khosru was succeeded by his son Ormazd IV (579–590), whose reign was an unfortunate one. Not only were his wars in Armenia unsuccessful, but his general Bahram Chubin, who had been deposed from his command by Ormazd, revolted in 589. At the same time the King became suspicious of his son Khosru Parwez, who implored the aid of the Emperor Maurice. Ormazd was dethroned and succeeded by Khosru (590–628). In 604, as the avenger of Maurice, who had been murdered by the Emperor Phocas, he took the field against the Greeks, who made but a feeble resistance to him, despite the efforts of Heraclius (q.v.). The Persians overran Armenia and in 614 penetrated Syria and even conquered Egypt, which they held until 618. This was, however, the last conquest of the Sassanids. In 623 the tide turned, and Heraclius inflicted defeat after defeat on Khosru, until in 627 the King was thrown into prison by one of his younger sons, Kavadh Sheroe, and murdered the year following. This son, who ascended the throne as Kobad II, after a reign of six months was the victim of a pestilence which devastated the country. He was followed by his infant son, Ardashir III (629–630), who was murdered by Shahrvarez or Farrukhan, the Persian commander in chief. Rapid changes of rulers followed, and such was the anarchy in Persia at this time that between the death of Khosru II in 628 and the accession of Yazdagard III in 632 there were 12 occupants of the throne. Yazdagard III (632–651), a grandson of Khosru, was the last of the Sassanids. At the time of his accession the Arabs were just entering upon their great career of conquest. After subjugating Syria they turned towards Persia. The Persians resisted bravely, but their forces were overthrown by those of the Caliph Omar at Kadisiyah (now Kadder) about 635. In the following year Ctesiphon fell, and a series of conquests gave the Arabs complete dominion over Persia. In 641 or 642 the defeat of the Persians at Nehavend terminated the reign of Yazdagard, who as a fugitive dragged out a miserable existence until he was murdered by a peasant for his clothing in 651.

The Sassanid rule was in general beneficial to Persia. The arts and sciences flourished, the government was fairly just, and the ancient faith of Zoroaster, which had declined, was revived and restored almost to its pristine purity.

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SASSARI, säs'sä-rē. The capital of the Province of Sassari, in the northern part of the island of Sardinia, 10 miles from the Gulf of Asinara (Map: Italy, B 4). It has broad streets, spacious squares, and several fine modern buildings. The fifteenth-century cathedral has a richly sculptured façade. The university, founded in 1677, contains a natural-history collection and a large library. There are several churches and palaces, a new theatre, a lyceum, a gymnasium, a seminary, and a technical institute. Sassari carries on a busy trade, chiefly with Genoa, in grain, wine, fruits, olive oil, and skins. There are manufactures of lead, zinc, matches, and leather. Its port is Porto Torres. Pop. (commune), 1901, 38,268; 1911, 43,118.

SASSOFERRATO, säs'sō-fĕr-rä'tō, Giovanni Battista Salvi (1605–85). An Italian religious painter of the Roman school, known by the name of his birthplace, the castle of Sassoferrato, near Urbino. He was son and pupil of Tarquinio Salvi, studied at Rome and Naples, and was influenced by the Caracci. Sassoferrato was a correct and careful draftsman and a gifted painter, but possessed the defects of the decadent seventeenth century. His favorite subjects were sentimental, sorrowing Madonnas, examples of which are to be found in many European galleries and in the Metropolitan Museum, New York. His masterpiece is the "Madonna of the Rosary" in the church of St. Sabina in Rome.

SASSULITCH, säs-sōō'lĭch, Viera. A Russian Revolutionist. See Zasulitch.

SASTEAN, säs'tē-an, Shastika, or Shasta. One of the numerous small linguistic families of Indians who formerly lived in the California-Oregon region. They called themselves Kŭtikĕkanać. Their home was the region drained by the Klamath River and its tributaries from the western base of the Cascade Range to the point where the Klamath flows through the ridge of hills east of Happy Creek. They extended over the Siskyou Range northward as far as Ashland, Oreg. They are now reduced to a mere handful, the most of them on the Grande Ronde and Siletz reservations in Oregon. The men are smaller and weaker than the women, who are charged with about all the work of their industrial life.

SA'TAN. See Devil.

SA'TANISM. The cult of Satan and an important phase of occultism. From the character of its worship it is necessarily secret, and precise details are difficult to acquire. The cult is an old one and in its origins reaches far back into primitive religion. Considering the actual phenomena presented by Satanism, it may be said that the cult reaches its acme in the Black Mass, which stands to it in the same relation as stands the White (or Christian) Mass to the Catholic church. The Black Mass is the direct opposite of the White Mass. The celebrant of the mass, who must have been a priest, is clad only in his sacrificial vestments, of which the chasuble may bear the figure of a goat, while the scarlet biretta is held by a woman dressed in scarlet who serves as deacon. Upon the altar is an inverted cross.

Incense is used during the mass, but is mingled with some foul-smelling substance. The Black Credo, which is a blasphemous antithesis of the Apostles' Creed, is recited.

In the mediæval period and as late as the famous Black Masses performed by Abbé Guibourg on the persons of Madame de Montespan and others, the altar was the reclining body of a nude woman, who held in her outstretched hands the lighted candles. The substances employed in the elements were numerous. Hosts which had been consecrated according to the rites of the church, either by Satanist priests or by true priests from whom they were stolen by false communicants organized for this purpose, played an important part. Of the other components, at least in former times, the least objectionable were the wafers prepared from the ashes of one murdered child mixed with the blood of another. On the completion of the sacrilege of the Black Host follow the defiance of Christ and the exaltation of Satan, after which the Black Mass apparently becomes a mere orgy of licentiousness.

Satanism seems to be in great part a survival of the worship of demons, for it does not regard Satan as beneficent or as ill-treated, but as a fiend more powerful than the powers of good, who have been unable to keep the promises made to the world. The Satanists thus stand in contrast to two classes of Devil worshipers with whom they have certain points in common—the Ophites, on the one hand, a Gnostic sect who regarded Yahwe as evil, but the serpent, because of his gift of knowledge to the world (Gen. iii. 5), as the greatest benefactor and deity of mankind; and the Persian Yezidis, on the other, who believe that the Devil will be restored to heaven and that those who are kind to him in his distress will be rewarded then, while those who are his enemies now will be punished by him in the future world. It is clear that phallicism plays an important part in this cult, both from the goat and the prominence given to women in the ceremonies. A striking analogue may be drawn between Satanism and the *vamacaryas*, or sectaries of the left-hand Tantra worship of India. (See SAKTAS.) Satanism may therefore be regarded in a very real sense as a survival of old pagan demon and fertility cults. This natural survival, however, became complicated by a revolt against the Catholic church, probably about the twelfth century. This side of the cult soon became the more pronounced and now absorbs all interest in the subject. It is, indeed, to this that Satanism probably owes its continued existence. The practical object of the Black Mass is to prepare Black Hosts for magic purposes. In mediæval times the ceremonies were often held at Druidical dolmens, which already had superstitious associations. The entire idea of the witches' Sabbath, made famous, e.g., by Goethe's scene of the Walpurgis-Night in *Faust*, is based on this cult.

The history of Satanism is obscure. Attempts have been made to prove Gilles de Laval, Baron de Retz (1396–1440) (see BLUEBEARD), one of its first adherents. It existed pertinaciously with a recrudescence in the reign of Louis XIV and is still practiced, especially in France. Its American stronghold is said by some to have been the ill-fated city of St. Pierre in Martinique.

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SATANSTOE, sā'tanz-tō'. A novel by James Fenimore Cooper (1845), a tale of Colonial life in New York. The title is the name of a neck in Westchester County.

SATAN'TA (Kiowa *Set-t'aiñ-ti*, white bear) (?–1878). A prominent Kiowa chief, distinguished alike for prowess and eloquence, and called the Orator of the Plains. He was acknowledged as a chief before 1864 and came into official prominence as one of the signers of the Medicine Lodge Treaty of 1867, by which his people agreed to come in upon a reservation. For an attack on a wagon train in Texas in 1871, in which seven white men were killed, Satanta and two other chiefs were tried for murder and sentenced to life imprisonment. He committed suicide by throwing himself from a window.

SATEEN'. A cotton or woolen fabric made to resemble satin. The term also applies to the form of weaving, and a distinction is sometimes made between satin and sateen—the term "real satin" applying to a warp-faced design, while sateen has the filling face. (See WEAVING.) The satin finish for cotton sateens is obtained by treatment with glycerin and repeated calendering.

SAT'ELLITES (OF., Fr. *satellite*, from Lat. *satelles*, attendant). Certain celestial bodies which revolve round some of the planets, as these latter revolve round the sun. Astronomers sometimes apply to them the generic term "secondary planets." The earth, Mars, Jupiter, Saturn, Uranus, and Neptune (qq.v.) each possess one or more of these attendants. The motion of all the satellites except the eighth and ninth satellites of Jupiter, Phœbe, the ninth satellite of Saturn, and those of Uranus and Neptune is direct, i.e., from west to east. In these exceptional cases the planes of revolution are nearly perpendicular to the ecliptic, and the motion is retrograde (q.v.), i.e., from east to west. The eclipses, inequalities, inclinations, and reciprocal attractions of the satellites have been carefully noted, and the theory of their motions, at least of the most prominent of them, has been found to coincide with that of the moon. See MOON.

SAT'IN (Fr. *satin*, ML. *setinus*, silken, from *seta*, silk, from Chin. *sse*, silk). A silk fabric, in satin weave (see WEAVING), i.e., with surface consisting entirely of parallel warp threads or of parallel weft threads. When the surface is of warp threads, the satin is called a warp satin; when the surface is of weft threads, the satin is called a weft satin. Satin is the most shiny and silky of all fabrics. A cotton or woolen satin is called sateen.

SAT'INWOOD'. A beautiful ornamental wood, obtained from both the West and East Indies. The former is the better kind and is supposed to be the product of a moderate-sized tree, *Parinarium guianensis*, and probably other species. That from the East Indies is less white in color and is produced by *Chloroxylon sweitenia*. Both are much used by cabinetmakers and for marquetry, etc. In Florida a kind of satinwood is produced by *Zanthoxylum cribrosum*. It is found in the Keys of Florida and Santo Domingo, Porto Rico, and Bermuda.

SATIRE, sāt'īr (Lat. *satira, satura*, medley,

from *satur*, full, from *sat*, enough). The name given by the Romans to a species of poetry of which they claimed to be the inventors. According to grammarians the complete term was *satura lanx*, from which *lanx*, meaning "a plate," dropped away. Among the Greeks the satire was called *sillos*, meaning "squint-eyed." Of Greek satirists the first master, who has been called the Greek Swift, was Archilochus, who flourished about 700 B.C. He was followed in the succeeding century by Simonides of Amorgus and by Hipponax. All three of these satirists seem to have directed their shafts chiefly against individuals. A certain number of the *silloi*, in elegiac verse, were composed by Xenophanes (died about 500 B.C.), who burlesqued Homer and Hesiod. The burlesque (see BURLESQUE) is of course related to the satire and should be considered in connection with it. Some fragments have survived of the *silloi*, in hexameter verse, of Timon of Phlius (died 268 B.C.), who waged war on the philosophers. In the comedies of Aristophanes satire assumed wide scope. And yet for Western Europe satire dates only from Latin literature. According to the Roman tradition the oldest Roman satires were medleys of scenic or dramatic improvisations expressed in varying metres (Livy, vii, 2), like the Fescennine verses (q.v.), but the sharp banter and rude jocularity of these unwritten effusions bore little resemblance, either in form or spirit, to the earnest and acrimonious criticism that formed the essential character of the later satire. According to the Roman tradition, again, the earliest writers of *saturæ*, or medleys, were Ennius (200 B.C.) and Pacuvius (170 B.C.); but the metrical miscellanies of these authors seem to have been little more than serious and prosaic descriptions or didactic homilies and dialogues. But the Roman tradition has been sharply challenged. For a thorough criticism of the views of those who have so challenged it, and good bibliography, consult Charles Knapp, "The Sceptical Assault on the Roman Tradition Concerning the Dramatic Satura," in *American Journal of Philology*, vol. xxxiii, 125–148 (New York, 1912). Lucilius (died 103 B.C.) is universally admitted to be the first who handled men and manners in that peculiar style which has ever since been recognized as distinctly satirical and an effective weapon for personal attack. After the death of Lucilius satire, as well as other forms of literature, languished; nor do we meet with any satirist of note till the age of Horace, whose verse, though sharp at times, is in the main humorous and playful. Persius (q.v.) resembles Horace in many ways, but is fundamentally more serious and sincere. It is different with Juvenal, somewhat later, for whom satire became a *sæva indignatio*, a savage onslaught on the open vice of the capital. After Juvenal we have no professed satirist, but, of several writers in whom the same element is found, Martial the epigrammatist is perhaps the most notable.

During the Middle Ages the satirical spirit showed itself abundantly in the general literature of France, Italy, Germany, England, and Scotland. Men who have a claim to the character of satirists, par excellence, are Ulrich von Hutten, one of the authors of the *Epistolæ Obscurorum Virorum*, Erasmus, Rabelais, William Langland, Skelton, Sir David Lindsay, and George Buchanan. Among the Elizabethans were Nash, Marston, Bishop Hall, and Donne. In France satire as a formal literary imitation of antiquity appeared early. Setting aside the Fabliaux, Rutebeuf, Jean de Meung, and other mediæval writers, Vauquelin may be considered one of the founders of modern French satire. The satirical verses of Mottin, of Sigogne, and of Berthelot, of Mathurin Regnier, *L'Espadon satirique* of Fouqueraux, and *Le Parnasse satirique*, attributed to Théophile Viaud, are foul in expression and remind us that at this time a satire was understood to be an obscene work—the seventeenth-century scholars supposing that the name had something to do with satyr, and that the style ought to conform to what might be thought appropriate to the etymology. During the seventeenth and eighteenth centuries both England and France produced professed satirists, who have not been surpassed by the best either of their forerunners or their followers. The names of Butler, Dryden, Pope, and Churchill in England, of Boileau and Voltaire in France, are among the greatest. Edward Young and Dr. Johnson were also distinguished satirists. It may be noticed, however, as a distinguishing characteristic of Dryden, Boileau, Young, Pope, Churchill, and Johnson, and as a mark of the difference of the times in which they lived, that it is no longer the Church that is assailed, but society, political opponents, literary rivals, etc. Swift, Arbuthnot, and Junius were the great prose satirists of their time.

Satire in the shape of political squibs and lampoons is abundant in the seventeenth and eighteenth centuries. Butler's *Hudibras* is one long caricature of the Puritans; most of the playwrights of the Restoration were Royalist satirists, unscrupulous and indecent partisans. Dryden himself was but *facile princeps* in the company. Andrew Marvel is the most famous name on the side of liberty. The *Beggars' Opera* of the poet Gay is a very fine bit of political satire. Gifford and Wolcot, better known as Peter Pindar, also deserve mention in an historical view, though their intrinsic merits are small. Incomparably superior to all their contemporaries and among the first order of satirists were Burns and Cowper. Meanwhile in France, since Voltaire, no great name had appeared, except perhaps that of Béranger. In Germany the most conspicuous modern names are those of Rabener, Hagedorn, Kästner, Lichtenberg, Stolberg, Wieland, Tieck, Jean Paul, Platen, and, notably, Heine; but none of these adhered strictly to the classic models. Of nineteenth-century satirists in England must be mentioned Byron, James and Horace Smith, Hunt, and Hood in poetry, and in prose Hook, Jerrold, Peacock, Thackeray, Disraeli, Carlyle, Samuel Butler, the author of *Erewhon*, and Bernard Shaw. The United States are excellently represented by Irving, Lowell, Holmes, Artemus Ward, and Mark Twain. Recent brilliant examples of the lighter satire are the "Dooley" papers contributed by F. P. Dunne to various American and English journals.

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SATIRE MÉNIPPÉE, sȧ'tēr' mȧ'nē'pȧ'. See MÉNIPPÉE.

SAT'IROMAS'TIX (from Lat. *satira*, satire + Gk. *μάστιξ*, *mastix*, scourge). A comedy by Thomas Dekker (1602) in which Ben Jonson figures as Horace junior. It is a good-humored retort to Jonson's *Poetaster*.

SAT'ISFAC'TION. In law, satisfaction of a debt or obligation imports a discharge of the obligation by payment or release or some agreement between the parties by which the claim is extinguished. It embodies a principle of universal application, and hence, where a legatee agrees to accept payment of a sum from the testator in satisfaction of a legacy of personal property, the legacy is said to be adeemed or brought back and canceled. In contracts, an agreement to paint a picture to the satisfaction of another is an absolute agreement, and even though such person is unreasonably dissatisfied, no liability can accrue. The rule is otherwise where the agreement is to build a boiler, e.g., to the satisfaction of the purchaser. As personal taste is not so directly involved in this instance, the purchaser is bound if he is unreasonably dissatisfied. See ACCORD AND SATISFACTION; ADEMPTION; CONTRACT.

SAT'LEJ. A river of India. See SUTLEJ.

SATOLLI, sȧ-tōl'lē, FRANCESCO (1839–1910). An Italian cardinal, born at Perugia, where he pursued his studies at the Diocesan Seminary. Pope Leo XIII appointed Satolli to a professorship in the Roman Seminary and School of the Propaganda. In 1888 Satolli was made titular Archbishop of Lepanto. Later, when new questions came to the church in the United States, Monsignor Satolli was sent out as Papal Ablegate with plenary power (November, 1892), which was confirmed by his appointment in January, 1893, as Apostolic Delegate to the American Church, with an official residence in Washington. Monsignor Satolli has written several valuable works, among them a commentary on St. Thomas Aquinas (1884–88), a *Course in Philosophy*, much used in Catholic institutions of learning, and *Loyalty to Church and State* (Baltimore, 1895). He was elevated to the cardinalate in 1895 and was recalled and succeeded by Archbishop Sebastiano Martinelli in 1896. In 1904 he visited the United States again, at the time of the St. Louis Exposition. He died at Rome, Jan. 8, 1910.

SÁTORALJA-UJHELY, shä'tō-rŏ-lyŏ o͞o'y'-hĕl-y'. The capital of the County of Zemplin, Hungary, 105 miles northeast of Budapest. It is picturesquely situated at the base of the Hegyalja, one of the offshoots of the Carpathians. It has a Piarist Gymnasium and is noted for its wine and tobacco. Pop., 1900, 16,712; 1910, 19,550.

SATOW, sȧt'ō, SIR ERNEST MASON (1843–). A British diplomatist and scholar, born in London. After graduation at University College, London, he entered the British civil service. In the consular service in Japan he rose to be Japanese Secretary to the British Legation, was transferred to Siam as Consul General in 1884, and became Minister Resident there in 1885. In 1888 he became Minister Resident at Montevideo, in 1893 was sent to Morocco as Minister, and two years later to Japan. Transferred in 1900, after the Boxer uprising, to Peking, he took a prominent position in the settlement of the indemnity and other questions. (Consult P. Clements, *Boxer Rebellion*, New York, 1915.) Satow remained at Peking as Minister until 1906. In 1907 he was a British delegate to the Second Hague Conference. He had received the K.C.M.G. in 1895, and honorary degrees were conferred on him by Oxford, Cambridge, and Marburg. With Hawes he edited the first and second editions of *Murray's Hand Book for Japan* (1882) and, with Ishibashi, an *English-Japanese Dictionary* (1876). He wrote the *Jesuit Mission Press in Japan, 1591–1610* (1888) and many papers of great learning and of the highest value in the *Transactions of the Asiatic Society of Japan*, particularly in connection with Shinto (q.v.).

SAT'SOP, or **SAT'CAP.** A division of the Lower Chehalis Indians, Washington. See SALISHAN STOCK.

SATSUMA, sät'so͞o-mȧ. A province of Japan, occupying the southern portion of the island of Kiushu and now included in the Prefecture of Kagoshima (q.v.). It was long held as a fief of the princely house of Shimadzu, has produced a large number of able men, and has always played a very important part in the history of the country. The clan had a leading place in the revolution of 1868. Its statesmen have preponderated in the national council for many years. The province is noted for its faïence. It was at Kagoshima, the chief town of the province, that Francis Xavier landed in 1549 to begin his missionary labors. For the Satsuma Rebellion, see SAIGO.

SAT'TERLEE, HENRY YATES (1843–1908). An American Protestant Episcopal bishop. He was born in New York City and received his degree from Columbia College in 1863. In 1866 he completed the course of the General Theological Seminary and was ordained priest. Until 1882 he was connected with Zion Parish, Wappinger's Falls, N. Y. Thereafter he was rector of Calvary Church, New York, until in 1896 he was consecrated first Bishop of Washington, D. C. His publications include: *A Creedless Gospel and the Gospel Creed* (1894), his principal works; *New Testament Churchmanship* (1899); *The Building of a Cathedral* (1902).

SATTLER, zät'lĕr, JOSEPH (1867–). A German illustrator, draftsman, and painter. He was born in Schrobenhausen (Bavaria) and studied under Heinz Heim and at the Munich Academy. In a series of original drawings, such as "Scenes from the Peasants' War" and a "Modern Dance of Death," and in numerous *Ex Libris* (published 1893), he cleverly attempted to revive the technique and motives of the old German wood engravers, especially Dürer. His modern subjects, which include "The Spring," "The International Art-War," and "My Harmonies," are less successful. He is best known, however, for his illustrations for the *Fliegende Blätter*, *Pan*, Grimmelshausen's *Simplicissimus*, and the sumptuous edition of the *Nibelungenlied* published by the Imperial Press (Berlin, 1904). He made his home in Strassburg.

SAT'URA'TION (Lat. *saturatio*, from *saturare*, to fill, saturate, from *satur*, full; connected with *sat*, *satis*, enough). A popular term for *chroma*, i.e., the purity of color sensation, its relative deficiency of gray mixture. Together with hue and tint, saturation determines the total color impression. The redder a red, the bluer a blue, of any given tint, the more saturated are these colors. Wholly saturated colors are not demonstrable.

The term may also be used, by transference, to denote the purity of a colorless sensation, i.e., its degree of freedom from color.

SATURDAY REVIEW, The. A London weekly review of politics, literature, science, and art, founded in 1855 by John Douglas Cook, under whose editorship it maintained a high rank in its class.

SAT'URN (Lat. *Saturnus*, OLat. *Sateurnus*, *Sœturnus;* connected with *sator*, sower, *serere*, to sow). An ancient Roman divinity who presided over the sowing of the seed. His festival occurred on December 17, after the conclusion of the winter sowing. (See Saturnalia.) A temple was built in 497 B.C. at the foot of the Capitol and became later the place of deposit for the state's treasury. (See Saturn, Temple of.) Early, however, Saturn was identified with the Greek Cronos, and the offerings to him were made according to the Greek rite (i.e., the head of the worshiper was bare). Probably in consequence of this identification arose the legend that Saturn was an ancient king of Latium, welcomed to Italy and to Rome by an Italian god, Janus; under his gracious rule the whole of Italy had enjoyed a golden age. There were many sanctuaries to Saturn in Italy; towns and especially mountains were named after him. Ops, a goddess of plenty, was regarded as the wife of Saturn. A sanctuary of Ops, so sacred that into it only the pontifex maximus (see Pontifex) and the Vestal Virgins might enter, was in the Regia (q.v.) at Rome. In the Greek myth Cronus (Κρόνος) appears as the eldest of the Titans (q.v.), son of Uranus and Gæa. He mutilated his father and became the ruler of the universe. Since it had been prophesied that he would be overthrown by one of his own children, he swallowed his children by Rhea—Demeter, Hera, Hestia, Hades, Poseidon—as fast as they were born. At last, after the birth of Zeus, Rhea tricked Cronos into swallowing a stone wrapped in swaddling clothes. Zeus, as he grew up, persuaded his father to disgorge his elder children and presently began the war against the forceful rule of the Titans that he might establish a reign of law. After a fierce conflict Cronus was cast into Tartarus. (See Jupiter.) Later poets represent him as afterward released and ruling in happiness over the Islands of the Blessed. Only at Athens and Olympia were there special shrines and offerings to Cronus, and a festival in his honor, the Cronia. His rule, too, was accounted, in some stories, a golden age; he was also a god of harvests. The erroneous idea that he was a god of time arose through an easy confusion of Κρόνος, *Kronos*, and χρόνος, *chronos*, time. In representations of Cronus his head was usually covered with a mantle, and in his hand was the curved scimitar or knife, *harpe*, or sickle. Consult: L. R. Farnell, *The Cults of the Greek States*, vol. i (Oxford, 1896); W. W. Fowler, *Roman Festivals* (London, 1899); Otto Gruppe, *Griechische Mythologie und Religionsgeschichte* (2 vols., Munich, 1906); W. W. Fowler, *The Religious Experience of the Roman People* (London, 1911); Georg Wissowa, *Religion und Kultus der Römer* (2d ed., Munich, 1912).

SATURN. The sixth of the planets in order of distance from the sun and the second in size. Its distance from the sun varies between 861 and 911 millions of miles; period of revolution, about 20 solar years; axial rotation period, about 10 hours, 14 minutes; the apparent angular diameter of the disk, between 14 seconds and 20 seconds; diameter, 73,000 miles; volume, 760 times that of the earth; mass, 75 times the earth's. Therefore Saturn's density is only one-eighth that of the earth, or not much more than one-half that of water. The inclination of the axis to Saturn's orbit is about 27°. The bright ball of the planet is set in the centre of a luminous oval ring and surrounded by at least eight moons; truly a planetary system of extreme complexity and of surpassing beauty. The ring system was discovered by Galileo in 1610, just after the invention of the telescope, but he did not explain correctly what he saw. He thought the planet's ball had two appendages or *ansæ*, and announced that it was triple. Huygens, in 1655, gave the correct explanation of the visible phenomena and showed that the planet must be surrounded by a ring. The ring system is round, but appears oval as a result of foreshortening, since the plane of the ring is not square to our line of vision. At other times the ring disappears altogether, in consequence of its plane passing between the earth and the sun. When this occurs, only the side of the ring towards the sun is illuminated. Modern observers have found the ring to be in reality triple, consisting of concentric parts. Mathematical researches have shown that its durability would be impaired if it were solid. If such were the case, any temporary disturbance or perturbation would suffice to disrupt it and the fragments would be precipitated on the planet. Nor can the ring be liquid. The only remaining conclusion is that it is composed of a very large number of small satellites, analogous to the ring of small planetoids (q.v.) surrounding our sun and lying between the orbits of Mars and Jupiter. This theory of the rings has received strong confirmatory evidence from spectroscopic observations made in 1895 by Keeler. See Astronomy; Planets.

NAME	Discoverer	Date of discovery	Sidereal period	Greatest distance from Saturn in terms of its equatorial radius	Mass, that of Saturn being 1
Mimas	W. Herschel	July 18, 1789	0 d. 22 h. 37 m.	3.07	0.00000007
Enceladus	W. Herschel	Aug. 29, 1789	1 d. 8 h. 53 m.	3.94	0.00000025
Tethys	J. D. Cassini	Mar. 21, 1684	1 d. 21 h. 18 m.	4.87	0.00000110
Dione	J. D. Cassini	Mar. 21, 1684	2 d. 17 h. 41 m.	6.25	0.00000187
Rhea	J. D. Cassini	Dec. 23, 1672	4 d. 12 h. 25 m.	8.73	0.00000400
Titan	Huygens	Mar. 25, 1655	15 d. 22 h. 41 m.	20.22	0.00021277
Themis	W. H. Pickering	Apr. 25, 1905	20 d. 20 h. 24 m.	24.00	.....
Hyperion	G. P. Bond	Sept. 16, 1848	21 d. 6 h. 39 m.	24.49	.....
Iapetus	J. D. Cassini	Oct. 25, 1671	79 d. 7 h. 56 m.	58.91	.....
Phœbe	W. H. Pickering	Aug. 16, 1898	546 d. 12 h. 0 m.	225.00	.....

Satellites. Saturn has at least 10 satellites.

The motion of Phœbe, the ninth satellite in order of discovery, is, like that of the eighth and ninth satellites of Jupiter and the satellites of Uranus and Neptune, retrograde, i.e., from east to west. Their elements are given in the table shown on page 485.

SATURN, Temple of. A temple in the Roman Forum, consecrated in 491 B.C. by the consuls Sempronius and Minucius and restored about 44 B.C. by Munatius Plancus. It stood at the foot of the Clivus Capitolinus, where eight of its marble columns on a substructure 16 feet in height still form one of the conspicuous monuments of the Forum. The temple was from very early times not only a place of worship but also a public treasury. Consult Christian Hülsen, *The Roman Forum* (Eng. trans. by J. B. Carter, 2d ed., Rome, 1909), and S. B. Platner, *The Topography and Monuments of Ancient Rome* (2d ed., Boston, 1911).

SAT'URNA'LIA (Lat. nom. neut. pl., relating to Saturn, from *Saturnus*, Saturn). An ancient Roman festival in honor of Saturn (q.v.). It began on December 17. The public religious rites were confined to that day. The festivities, however, lasted during the later Republic for seven days. Augustus made the holiday cover three days, but his successors extended it to five. The festival was originally agricultural, connected with the end of late sowing, and also the turning of the year at the winter solstice; but the ritual has been so transformed by the Hellenizing of Saturn and his worship that the original elements can scarcely be discerned. The change is connected with the lectisternium (q.v.) at the Temple of Saturn in 217 B.C., when a public banquet was held and this new celebration of the Saturnalia enjoined in perpetuity. At the sacrifice the senators and knights wore the toga, but this was laid aside for the banquet. After the banquet the populace roamed through the city, shouting *Io Saturnalia.* Next day, after an early bath, came a family sacrifice, of a young pig. The rest of the day and the following days were given up to the exchange of calls, presents, and banquets, at which a king was chosen whom all must obey. Favorite presents were wax tapers and little clay or pastry images (the sigillaria). The days following the 17th, on which these figures were sold, were called the Sigillaria. During this period the courts and schools were closed and military operations were suspended that the army might celebrate. A special feature of the Saturnalia was the freedom given to the slaves, who even had first place at the family tables and were served by their masters. Later speculation interpreted this as a reminiscence of the golden age under King Saturnus. On December 15 occurred the Conseralia, and on December 19 the Opalia, in honor of Consus and Ops (see Saturn), both of whom seem to have been deities connected with the storing of the grain. Consult: W. W. Fowler, *Roman Festivals* (London, 1899); id., *The Religious Experience of the Roman People* (ib., 1911); Georg Wissowa, *Religion und Kultus der Römer* (2d ed., Munich, 1912).

SATUR'NIAN VERSE (Lat. *Saturnius*, relating to Saturn, from *Saturnus*, Saturn). The species of verse in which the oldest Latin poetry was composed, the one indigenous Latin verse form. By the later Roman grammarians the phrase is applied in a general way to denote the rude and unfixed measures of the ancient Latin ballad and song and is not intended to determine specifically the character of the metre. Saturnian verse was used first by Livius Andronicus (q.v.), in his translation of the Odyssey; next by Nævius (q.v.), in his original epic, the *Bellum Punicum;* and continued in use down to the time of Ennius (q.v.), who introduced the hexameter (q.v.). In the treatment of it a wide and arbitrary freedom was taken by the old Roman poets, as is proved by the still extant fragments of Nævius and Livius Andronicus and of the early epitaphs and inscriptions. The main question at issue concerning the Saturnian verse is whether it was quantitative, as all other Latin verse forms were (these were based on Greek originals), or accentual, as English verse is. Lindsay well represents the latter view, Leo the former. (See below.)

Bibliography. L. Havet, *De saturnio Latinorum Versu* (Paris, 1880); Keller, *Der Saturnische Vers* (Prague, 1883, 1886); C. Zander, *Versus Italici Antici* (Lund, 1890); W. M. Lindsay, "The Saturnian Metre," in *American Journal of Philology,* vol. xiv (New York, 1893); Theodor Mommsen, *History of Rome,* vol. i (Eng. trans. by Dickson, ib., 1894); F. Leo, *Der Saturnische Vers* (Berlin, 1905); E. H. du Bois, *Stress Accent in Latin Poetry* (New York, 1906).

SAT'URNI'NUS, Lucius Apuleius (?–100 B.C.). A Roman demagogue, tribune of the people in 102 and 100 B.C. He procured his reëlection by the help of Marius (q.v.) and Glaucia as well as by the murder of his opponent. To this violence and to the alliance with the popular party it is supposed Saturninus was led because of his removal by the Senate from the post of quæstor at Ostia (q.v.); such removal was uncommon. In the first year of his tribunate he had introduced a law of *majestas,* by which the old right of trial under the charge of *perduellio* (or treason) by a board of two, with right of appeal to the Comitia (q.v.), was superseded. In his success Saturninus overstepped the mark by his grain laws, which almost gave away the public grain. He caused the murder of Memmius, who contested Glaucia's reëlection. The popular uprising drove him and Glaucia to the Capitol. They surrendered to Marius, but were killed in the Curia (q.v.), where Marius had put them for safe-keeping.

SATYR, săt'ẽr *or* sā'tẽr (Lat. *Satyrus,* from Gk. Σάτυρος, Satyros). In Greek mythology, one of the deities or spirits of the woods and hills, usually represented in early art with goat's ears, tails, and hoofs, often bearded and old, though in later times these bestial traits are much reduced and scarcely extend beyond the pointed ears and occasionally a small tail. In the fourth century B.C. we find the satyr figured as a graceful youth whose animal nature is scarcely indicated, while in Hellenistic times appears the different type of the rough peasant boy whose features show plainly his vulgar and mischievous disposition. From Hesiod down the satyrs are constant figures in Greek literature as well as art, especially as companions of Dionysus (see Bacchus). They appear as sensual pursuers and ravishers of the woodland nymphs, fond of wine and also of the music of the woods, playing the syrinx, flute, and even the bagpipe. The older satyrs were called *sileni,* the younger *satyrisci.* The corresponding Latin title is *fauni.* (See Faunus.) At Athens a form of

the drama which parodied the myths of gods and heroes, and in which the chorus was composed of satyrs, was known as the satyr drama or the satyric drama. Satyr plays formed postludes to the tragedies of the trilogy or the tetralogy. Only one satyr play is extant, the *Cyclops* of Euripides. For the satyr drama, consult: Adolf Furtwängler, *Der Satyr aus Pergamon* (Berlin, 1880); J. P. Mahaffy, *A History of Classical Greek Literature* (2d ed., London, 1892); R. G. Moulton, *The Ancient Classical Drama* (2d ed., Oxford, 1898); Christ-Schmid, *Geschichte der griechischen Litteratur*, vol. i, part i (6th ed., 1912).

SATYR. A member of a subfamily (Satyrinæ) of medium-sized, usually brown or gray butterflies, the wings of which are very generally ornamented, especially on the undersides, by eyelike spots. About 60 species occur in the United States. They are weak flyers, and most of them are forest lovers, although some are found upon the Western prairies. The veins of the fore wings are greatly swollen at the base. The larvæ are cylindrical and are distinguished from other American butterflies, except those of the genus *Chlorippe*, by their bifurcated anal extremities. They are usually pale green or light brown and feed upon grasses or sedges, remaining concealed during the day and emerging at dusk to feed. In the tropics the satyrs are often gayly colored. One very rare species (*Œneis semidiæ*) is remarkable on account of its distribution. It occurs in the United States only on the highest peaks of the White and Rocky mountains and is believed to have been a species of wide distribution in glacial times. When the ice broke up, the mass of the butterflies were exterminated by the encroaching heat, but a few individuals survived in the congenial coolness remaining on the peaks of the highest mountains.

SATYRIC (sȧ-tĭr'ĭk) **DRAMA.** See SATYR.

SAT'YRUS. See CHION.

SAUBA (są'bȧ) **ANT** (*Saüba*, South American Indian name). A neotropical leaf-cutting ant (*Œcodoma cephalotes*) which makes very remarkable underground mines. They excavate a series of tunnels and nests which extend through many square yards of earth and are said to have tunneled under the bed of the river Parahyba at a spot where it was as broad as the Thames at London Bridge. H. W. Bates has shown that in the communities of this ant there are surely five castes—males, females, small ordinary workers, large workers with very large hairy heads, and large workers with large polished heads.

SAUER, zou'ĕr, EMIL (1862–). A German pianist, born at Hamburg. First instructed by his mother, he became a pupil of Nicholas Rubinstein at the Moscow Conservatory in 1879. Two years later he began his career. Although he met with great success from the beginning, he spent the winter of 1884–85 studying with Liszt at Weimar. After that he toured Europe, and visited the United States in 1898 and 1908. From 1901 to 1907 he was director of the Meisterschule of the Vienna Conservatory. He edited the complete piano works of Brahms. His original compositions include two concertos for piano (E minor and C minor); *Suite Moderne;* a number of concert pieces for piano. He also wrote *Meine Welt: Bilder aus dem Geheimfache meiner Kunst und meines Lebens* (1901).

SAUGER, są'gĕr, or SAND PIKE. A pike perch (q.v.) of the Great Lakes and the upper Mississippi tributaries, more elongated and cylindrical than the wall-eyed pike, with a distinct black blotch on the base of the pectoral fin. It is 10 to 18 inches long. This fish is also locally known as gray pike, rattlesnake pike, ground pike, and hornfish. See Plate of PERCHES OF NORTH AMERICA.

SAUGERTIES, są'gĕr-tēz. A village in Ulster Co., N. Y., 12 miles north of Kingston, on the Hudson River and on the West Shore Railroad (Map: New York, F 6). It has important stone quarries. Paper and various paper products, cut glass, brick, and cement are manufactured. There are a Carnegie library, a park, and a high school. The first settlers probably came as early as 1687, and in 1710 a colony of Palatines settled here. The village was incorporated in 1831. Pop., 1900, 3697; 1910, 3929; 1915 (State census), 4485. Consult Brink, *The Early History of Saugerties* (Kingston, N. Y., 1902).

SAUGOR'. A low swampy island of Bengal, India, at the mouth of the Hugli. It is one of the holy places of the Hindu religion, noted formerly for its infant sacrifices. It is visited by multitudes of pilgrims in November and January at the time of the full moon, when, after the ceremony of purification, a great fair takes place. The island has an area of 225 square miles, chiefly covered with jungle, infested by tigers and other wild animals. Among its structures are a lighthouse, visible 15 miles, and meteorological stations. A cyclone and a tidal wave devastated the island in 1864, sweeping away over two-thirds of the inhabitants.

SAUGUS, są'gŭs. A town, including three villages, in Essex Co., Mass., 8 miles north of Boston, on the Saugus River and Massachusetts Bay and on the Boston and Maine Railroad (Map: Massachusetts, F 3). It has a public library. Brick, spices, iron-foundry products, rubber goods, and woolen goods are manufactured. Abundant water power is derived from the river. Pop., 1900, 5084; 1910, 8047; 1915 (State census), 10,141; 1920, 10,874.

SAUK (from their own name, *Osagi*, of uncertain etymology, also known as Sac, and frequently referred to, in connection with their confederated tribe, under the compound title of Sacs and Foxes). A prominent and warlike tribe of Algonquian stock (q.v.), formerly holding both banks of the Mississippi and the entire Rock River region in northwestern Illinois, eastern Iowa, and southwestern Wisconsin, with a portion of Missouri. According to tradition they once lived on the Ottawa River, Canada, but, with other tribes, were driven out by the attacks of the Iroquois. About 1670 they were found by the French in northern Wisconsin, in immediate vicinity of their close kindred, the Muskwaki or Foxes. From this position the two tribes were gradually pressed southward by the Ojibwa. The Foxes suffered severely in a war with the French and in a great battle with the Ojibwa about 1760 were so greatly reduced that they were forced to confederate with the Sauk. In 1832 a considerable party, led by Black Hawk (q.v.), combined to resist the execution of a treaty by which the Indians were to give up all their lands east of the Mississippi, but in the short war they were defeated. The Indians removed to the west side of the Mississippi, in Iowa, and subsequently, in dif-

ferent bodies, to Kansas and Oklahoma. A part of those who removed to Kansas, chiefly of the Muskwaki or Fox tribe, afterward returned to Iowa and repurchased lands near Tama. In 1910 the Sauk and Muskwaki numbered together about 724. As a people they are strongly conservative. Consult *Indian Tribes of the Upper Mississippi Valley and Region of the Great Lakes* (Cleveland, 1911).

SAUL (Heb. *shāūl*, asked, or devoted, pass. p. of *shāal*, to ask). The first King of Israel. According to 1 Sam. xiii. 1, "Saul was one year old when he became King and he reigned two years over Israel." Some words have evidently fallen out which we have no means of restoring, and the whole verse seems to be a late insertion, as it was not found by the Greek translator. That he was 30 years old when he became King is a later guess. Jonathan was a young man when David fled, and he left children when he died; and David had a long career in the Negeb. Saul could not, therefore, have died at the age of 32. His reign may have begun as early as c.1050 B.C. He was a son of Kish, of the tribe of Benjamin. The story of his career in 1 Sam. ix–2 Sam. i seems to contain older and later elements. There seem to be two varying accounts of the manner in which he came to occupy his position as head of the people. According to one of these it was while searching for the lost asses belonging to his father that he encountered the seer Samuel, who announced to Saul that he was destined to deliver Israel from the oppression of the Ammonites and Philistines. Soon afterward Nahash, a chief of the Ammonites, laid siege to Jabesh-Gilead. The inhabitants appealed to the West-Jordan tribes for aid, and when the news reached Saul he gathered a force with which he inflicted a crushing defeat on Nahash. At Samuel's bidding the people then gathered at Gilgal and solemnly crowned Saul as King. The other account represents the people as dissatisfied with their condition and demanding of Samuel that a king be placed at their head. Samuel, while rebuking the people, nevertheless yields to the popular request, and at an assembly held at Mizpah Saul is chosen.

Those who accept the above theory conclude from these varying accounts that it was not so much Samuel's interference as the natural course of events that brought Saul forward. The chief efforts of his career were directed towards reducing the power of the Philistines. In a series of well-directed campaigns he drove the Philistines back to their territory along the seacoast. He was equally successful in his campaign against the Amalekites. His victory over them represents the climax in his career. Intertribal jealousies and family intrigues loosened the union of the tribes after the crisis had been temporarily passed, while the growing popularity of the youthful David (q.v.), originally introduced at Saul's court as a skillful harp player, brought out the worst elements in Saul's nature. A strange melancholy settled upon him, and this illness, which at times resembled madness, was a factor leading to the quarrel between Saul and David and David's flight. Encouraged by this state of affairs, the Philistines roused themselves to renewed action and at Mount Gilboa succeeded in defeating the Hebrew army. Saul's three sons perished in the battle, while the King himself, when he realized the desperateness of the situation, "fell on his sword" and thus put an end to his life. Consult the chapters on Saul in the Hebrew histories of Stade, vol. i (Giessen, 1881), Renan (Paris, 1887), Kent (New York, 1891), Guthe (Freiburg, 1899), Piepenbring (Paris, 1899).

SAUL. 1. An oratorio by Handel (q.v.), first produced in London, Jan. 16, 1739. 2. A poem by Robert Browning (q.v.).

SAULCY, sō'sē', LOUIS FÉLICIEN JOSEPH CAIGNART DE (1807–80). An Oriental numismatist and antiquary. He was born at Lille, studied at the Ecole Polytechnique, in 1838 became professor of mechanics at Metz, and was later appointed conservator of the museum of artillery at Paris. His activity was mainly devoted to numismatics and archæology. In 1842 he became a member of the French Academy. Among his publications are: *Essai de classification des suites monétaires byzantines* (1836); *Recherches sur la numismatique punique* (1843); *Recherches sur la numismatique judaïque* (1854); *Voyage en Terre-Sainte* (1865); *Sept siècles de l'histoire judaïque* (1874); *Histoire des Machabées* (1880).

SAULLE, HENRI LEGRAND DU. See LEGRAND DU SAULLE, HENRI.

SAULSBURY, sąlz'bēr-ĭ, WILLARD (1861–). An American lawyer and legislator, born in Georgetown, Del. He was educated at the University of Virginia and was admitted to the bar in 1882. His family had produced two United States Senators and had long been a controlling factor in Delaware Democratic politics. Willard Saulsbury became interested in street railways and banking enterprises in Wilmington, where he organized the Equitable Trust Company. From 1882 until 1888 he was associated with Victor Du Pont, whose daughter he had married, and later he was a member of the successful firm of Saulsbury & Norris. He served as delegate at large from Delaware to the Democratic national conventions of 1896, 1904, and 1912, and between 1899 and 1911 was six times the nominee of the Democratic caucus for United States Senator. Eventually, in 1913, he was elected to the Senate, where he became chairman of the Committee on Coast and Insular Surveys.

SAULT SAINTE MARIE, sōō' sânt mā'rĭ, *Fr. pron.* sō sănt mà'rē'. A city, port of entry, and the district town of Algoma District, Ontario, Canada, opposite its Michigan namesake, on the St. Marys River, on the St. Marys Falls ship canal, and on the Canadian Pacific and Hudson Bay railways (Map: Ontario, A 1). A railway bridge, 1 mile long, spans the river between the two cities and connects the Northern Pacific Railroad with the Canadian Pacific. The city has federal and district buildings, a public library, and a technical school. The industrial establishments include steel mills, railway-car shops, foundries and machine shops, brickyards, breweries, and manufactories of chemicals and paper. Pop., 1901, 7169; 1911, 10,984.

SAULT SAINTE MARIE. A city and the county seat of Chippewa Co., Mich., 380 miles by rail west-northwest of Detroit, on the St. Marys River and on the Canadian Pacific, the Duluth, South Shore, and Atlantic, and the Minneapolis, St. Paul, and Sault Ste. Marie railroads (Map: Michigan, E 2). The ship canal here, connecting Lakes Superior and Huron, is noted for its extensive freight traffic. See SAINT MARYS CANAL. Other noteworthy

features are the International Bridge across the rapids of the Saint Marys River, the Carnegie library, Fort Brady, the railroad hospital, the fine new high school, city armory, Federal building, and Canal Park. The water power afforded by the rapids near the city generates electrical energy equivalent to 60,000 horse power, which is utilized by several important industries. There are lumber mills, paper mills, a large carbide manufactory, tanneries, dredging machinery works, flour and woolen mills, and fish-packing establishments. In 1641 the Jesuit Fathers Raymbault and Jogues established a mission here, but it was soon abandoned. In 1662 Father Marquette founded here the first permanent settlement within the present limits of Michigan. At this place in 1671 the French convoked a great congress of the Indian nations. Pop., 1900, 10,538; 1910, 12,615; 1915 (U. S. est.), 13,709; 1920, 12,096.

SAULT SAINT LOUIS, or **CAUGHNAWÁGA,** kạ′nâ-wä′gà (Mohawk, at the rapids). A village in Laprairie County, Quebec, Canada, 10 miles west of Montreal, on the St. Lawrence, at the head of the Lachine Rapids. It is inhabited exclusively by Roman Catholic Indians, remnants of the once powerful Iroquois, and is the largest Indian settlement north of Mexico. The old French town walls, built in 1721, are almost intact on three sides around the church; the presbytery, dating from 1725, contains the remains of the Mohawk saint, Tehgahkwíta, and the room and desk of Père Charlevoix the historian.

The village was established in 1676 under Jesuit direction by converts drawn from the Iroquois confederacy, chiefly Mohawks and Oneidas, and probably took its name from the ancient capital of the Mohawk tribe. The Caughnawâga Indians, famous as boatmen and lacrosse players, are also enterprising travelers and traders and in families and small parties journey even to the Pacific Ocean. Pop., 1901, 2110; 1911, 2500.

SAULT (sōō) **WHITEFISH.** See WHITEFISH.

SAUMAISE, sō′mâz′, CLAUDE DE. See SALMASIUS, CLAUDIUS.

SAUMAREZ, sō′mâ′râ′, JAMES, BARON DE (1757–1836). A British admiral. He was born in the Isle of Guernsey and entered the British navy in 1770. He distinguished himself during the attack on Charleston in 1776 and was under Sir Hyde Parker in the action off the Doggerbank in 1781. In 1782, as commander of the *Russell,* he shared Rodney's victory over De Grasse. After living some years on shore he made a gallant capture of the French frigate *La Réunion* in 1793. He fought in the battles of L'Orient (1795), St. Vincent (1797), and the Nile (1798). He became rear admiral of the blue in 1801 and in the same year gained a splendid victory over the French and Spanish off Cadiz (July 12). He subsequently commanded the Baltic fleet for a number of years. He became admiral in 1814, vice admiral of Great Britain in 1821, and was raised to the peerage in 1831. Consult: Sir John Ross, *Memoirs and Correspondence of Admiral Lord De Saumarez* (2 vols., London, 1838); A. T. Mahan, *Types of Naval Officers* (Boston, 1901); W. H. Fitchett, *Nelson and his Captains* (London, 1902).

SAUMUR, sō′mụr′. The capital of an arrondissement in the Department of Maine-et-Loire, France, 28 miles southeast of Angers (Map: France, N., E 5). It is dominated by a castle-crowned hill and is built partly on the left bank of the Loire and partly on an island. The school for cavalry, founded here in 1768, occupies a magnificent building and has extensive parade grounds. Other prominent features include the church of Saint-Pierre, dating from the twelfth century, the pilgrimage church of Notre Dame de Nantilly, the sixteenth-century town hall, the pilgrimage church of Notre Dame College, and the Museum of Science and Archæology. The town is noted for its wines and manufactures enameled goods. Saumur was one of the leading centres of Protestantism in France, but lost half of its population and its commercial prestige by the revocation of the Edict of Nantes. Pop., 1901, 16,233; 1911, 16,392.

SAUN′DERS, FREDERICK (1807–1902). An American librarian and author, born in London, England. He came to New York (1837), engaged in publishing, and was a pioneer in the agitation for international copyright. For some time he was city editor of the *Evening Post.* In 1859 he became assistant librarian of the Astor Library and head librarian in 1876, resigning in 1896. Among his writings, the more noteworthy are: *Salad for the Solitary by an Epicure* (1853) and *Salad for the Social* (1856), combined in 1899; *About Woman, Love, and Marriage* (1868); *Evenings with the Sacred Poets* (1869; new ed., 1899); *Pastime Papers* (1885); *Story of Some Famous Books* (1887); *Story of the Discovery of the New World by Columbus* (1892); *Character Studies, with Some Personal Recollections* (1894).

SAUNDERS, MARGARET MARSHALL (1861–). A Canadian author, born at Milton, Nova Scotia. Her many short stories and books are devoted chiefly to encouraging humane treatment of animals. *Beautiful Joe* (1894) gained the prize of the American Humane Educational Society, reached a circulation of over 500,000 copies, and was translated into several languages. Among her other works are: *Charles and his Lamb* (1896); *Deficient Saints* (1899); *For his Country* (1900); *Beautiful Joe's Paradise* (1902); *Princess Sukey* (1905); *Alpatok: The Story of an Eskimo Dog* (1906); *My Pets* (1908).

SAUNDERS, RICHARD. See POOR RICHARD'S ALMANAC.

SAUNDERS, THOMAS BAILEY (1860–). A British author, born at Alice, Cape Colony, and educated at King's College, London, and at University College, Oxford. He translated Schopenhauer's essays under the titles *The Wisdom of Life, Studies in Pessimism, The Art of Literature,* and *On Human Nature* (1889–96); with Huxley and Leighton prepared a volume called *Goethe's Maxims and Reflections* (1893); published versions of Harnack's *Christianity and History* (1896), *Thoughts on Protestantism* (1899), and *What is Christianity* (1901); and wrote *Schopenhauer* (1901) and *Professor Harnack and his Oxford Critics* (1902).

SAUNDERS, WILLIAM (1836–1914). A Canadian agriculturist, entomologist, and pharmacist. He was born in Devonshire, England, went to Upper Canada with his parents in 1848, and became a manufacturing chemist in London, Ontario. He also farmed extensively, studying soils and insects injurious to agriculture. He was professor of materia medica in Western University (1882–85), public analyst for West-

ern Ontario (1882–86), one of the founders of the Ontario Entomological Society and president thereof in 1883–86, and also one of the founders, and for two years president, of the Ontario College of Pharmacy. In 1885 he was commissioned by the Dominion government to report upon agricultural experimental work in the United States and Europe; and the result was the Canadian law providing government experimental farms. These were under Saunders's control from 1886 to 1911, when he retired on a pension. He was one of the original fellows of the Royal Society of Canada in 1881, and president of the society in 1906.

SAUNDERS, William Lawrence (1856–). An American engineer, born at Columbus, Ga. In 1876 he graduated from the University of Pennsylvania and in 1878–81 had charge of hydrographic and subaqueous work for the National Storage Company at Communipaw, N. J. Later he became president of the Ingersoll-Sergeant Drill Company and was made an officer in other tool and machinery manufacturing companies. Saunders invented apparatus for drilling rock under water, patented devices for quarrying rock, and originated the system of pumping liquids by compressed air now in use in the Russian oil fields. In 1915 he was appointed by Secretary Daniels a member of the United States Naval Advisory Board. Saunders edited *Compressed Air Information* (1903).

SAUN'DERSON, Edward James (1837–1906). An Irish politician, born in County Cavan. He was educated chiefly at Nice, France. In 1865 he became a member of Parliament for Cavan as an adherent of Lord Palmerston, was reëlected in 1868, but was defeated by the home-rulers in 1874. From this time he was active as an Orangeman and as a leader of the Irish Unionists and from 1885 until his death represented North Armagh in Parliament, where he was the most formidable opponent of the Nationalists. He engaged his Irish foes in a free fight on the floor of the House of Commons in 1893. In 1898 he was created Privy Councilor and in 1901–03 was grand master of the Orange lodges at Belfast. Saunderson was author of *Two Irelands, or Loyalty versus Treason* (1884) and *Present and Everlasting Salvation* (1907).

SAUNDERSON, or **SANDERSON,** Nicholas (1682–1739). An English mathematician, born at Thurlston, Yorkshire. When only one year of age he lost his sight from smallpox. In spite of this infirmity he became proficient in the classics and in mathematics. At the age of 25 he was taken to Christ's College, Cambridge, where he had hoped to be admitted. Lack of means, however, barred him, but by the consent of Whiston, then Lucasian professor, he was allowed to lecture on mathematical physics. On Whiston's expulsion from his professorship Saunderson by royal patent was made M.A. (1711) and installed in it. He was a fellow of the Royal Society (1719). His *Algebra* was published soon after his death (2 vols., 1740–41). A few years later appeared his *The Method of Fluxions, etc.* (1751). For his biography, consult the preface to his *Algebra* (Cambridge, 1740–41).

SAUPPE, zoup'pe, Hermann (1809–93). A German classical scholar, born at Wesenstein. After studying at Leipzig he was professor extraordinary at the University of Zurich in 1838–45, director of the Gymnasium at Weimar in 1845–56, and finally professor of philology at the University of Göttingen (1856), where he remained until his death. Sauppe won his greatest fame by his researches in the field of Greek oratory. Among his works on this subject are editions of the *Oratores Attici* (1839–50, with Baiter), selected orations of Demosthenes (1845); and the *Epistola Critica ad Godofredum Hermannum* (1842), containing criticisms of the text of the Orators and of Plato, considered one of the most valuable modern treatises on the methodology of textual criticism. His library was bought by Bryn Mawr College. Consult J. E. Sandys, *A History of Classical Scholarship*, vol. iii (Cambridge, 1908).

SAUR, Christopher. See Sower, Christopher.

SAU'REL. A small active carangid marine fish of the genus *Trachurus*. One species (*Trachurus saurus*) is mainly South European and is known to the English as horse mackerel; another (*Trachurus symmetricus*) is the horse mackerel of California. These fishes share the names "jurel" and "gascon" with related genera. See Plate of Horse Mackerel.

SAURET, sō'rā', Emile (1852–1920). A French violinist, born at Dun-le-Roi, Cher. He studied at the Paris Conservatory and was a pupil of Bériot at Brussels. From 1880 to 1881 he was teacher at Kullak's Akademie in Berlin and in 1890 he was appointed professor of the violin at the London Royal Academy of Music to succeed Sainton. From 1893 to 1906 he was connected with the Ziegfeld Conservatory of Chicago and appeared frequently throughout the United States. In 1908 he returned to London. Among his works are: *Gradus ad Parnassum du violoniste* (1894), 2 violin concertos, about 130 other pieces for the violin with or without the orchestra, 20 grandes études, 12 études artistiques, and about 25 transcriptions.

SAU'RIA (Neo-Lat. nom. pl., from Gk. *σαῦρος, saũros,* lizard). A subclass of the Reptilia, including the Autosauri or Lacertilia (lizards) and the Ophidia (snakes), defined by Gadow as reptiles with movable quadrate bones, with a transverse external cloacal opening, near the posterior lateral corners of which open the reversible paired copulatory organs. See Reptile. Consult Hans Gadow, "Amphibia and Reptiles," in *Cambridge Natural History*, vol. viii (London, 1901), and E. G. Boulenger, *Reptiles and Batrachians* (New York, 1914).

SAURIN, sō'răn', Jacques (1677–1730). A celebrated French Protestant preacher. He was born at Nîmes, studied at Geneva, and was chosen minister of a Walloon church in London in 1701. In 1705 he settled at The Hague, where his extraordinary gift of pulpit oratory was much admired. As a preacher Saurin has often been compared with Bossuet, whom he rivals in force, if not in grace and subtlety of religious sentiment. His discourses upon the more memorable events in the Bible were published at The Hague in 1728–39 and his sermons in 1748–65; an English translation of the latter appeared at London, 1824. Consult his *Life*, by J. J. Van Oostergu (Brussels, 1856), E. A. Berthault (Paris, 1875); E. Lambert, *Essai homiletique sur la prédication de Saurin* (Montauban, 1892).

SAUROP'ODA. See Dinosauria.

SAUROP'SIDA (Neo-Lat. nom. pl., from Gk. *σαῦρος, sauros,* lizard + *ὄψις, opsis,* appear-

ance). A division of Vertebrata, proposed by Huxley to include the birds and reptiles, which are closely related, as contrasted with the Ichthyopsida (fishes and amphibians) or with the Mammalia.

SAU'RY, or SAURY PIKE. See SKIPJACK.

SAUSAGE. See PACKING INDUSTRY.

SAUSAGE POISON. A disease, sometimes called botulism, caused by eating diseased sausage or ham. In 1898 Van Ermengem discovered in unboiled ham, as well as in the spleen of persons who were poisoned by eating it, a rod-shaped bacterium with spore formation at its end, which he termed *bacillus botulismus.* Filtered and germ-free solutions of this ham contained a toxin fatal to animals. See TRICHINIASIS.

SAUSSAYE, PIERRE DANIEL CHANTEPIE DE LA. See LA SAUSSAYE, P. D. C. DE.

SAUSSIER, sō'syā', FELIX GUSTAVE (1828–1905). A French general, born at Troyes. He studied at Saint-Cyr and entered the army as lieutenant in 1850. He fought in Algeria, took part in the Crimean War, the Italian War of 1859, and the Mexican expedition, and in 1869 was made colonel. In the Franco-German War he distinguished himself at Colombey-Nouilly and Gravelotte. Taken prisoner at Metz in 1870, he escaped, returned to France by way of Austria and Italy, and joined the Army of the Loire. He was made a brigadier general and from 1871 to 1873 served against the Kabyles in Africa. In 1873 he was returned as deputy for the Department of Aube and in the National Assembly adhered to the Left Centre, taking an active share in all questions of military reform. In 1878 he became general of division, in 1881 was commander in chief of the army in Algeria and repressed a formidable uprising in Tunis, and in 1884 was appointed military governor at Paris. He retired in 1898.

SAUSSURE, ADRIENNE ALBERTINE NECKER DE. See NECKER DE SAUSSURE, A. A.

SAUSSURE, sō'sūr', HORACE BÉNÉDICT DE (1740–99). A Swiss physicist and geologist, born at Conches, near Geneva. At 22 he accepted the chair of physics and natural philosophy at the University of Geneva. In 1768 he commenced the series of scientific journeys that have made him famous, during the course of which he traversed the Alps, the Jura, the Vosges, and the mountains of England, France, Germany, Italy, and other countries. The results of his extensive observations of the geological, botanical, and meteorological features of the mountainous regions he visited were embodied in *Voyages dans les Alpes* (4 vols., 1779–96). The works by Saussure also include: *Observations sur l'écorce des feuilles et des pétales* (1762); *De Præcipuis Errorum Nostrorum Causis, ex Mentis Facultatibus Oriundis* (1762); *De Electricitate* (1766); *De Aqua* (1771); *Sur l'hygrométrie* (1783), the last named embodying the results of researches in regard to the properties of moisture-laden air.

SAUSSURE, NICOLAS THÉODORE DE (1767–1845). A Swiss botanist, son of Horace de Saussure, born in Geneva and educated there. He assisted his father in his physical researches and in his orographical studies and made some valuable experiments as to atmospheric density. But his work on plant physiology, *Recherches chimiques sur la végétation* (1804), is his great claim to fame. He was the first to undertake a quantitative analysis of the nutriment of plants and urged the thesis that the vegetable organism is formed from carbonic acid abstracted from the air.

SAUTER, sou'tēr, GEORGE (1866–). A portrait painter, who, although born at Rettenbach (Bavaria), and a pupil of the Munich Academy, sojourned in England in 1889 and made London his residence after 1895. Between these dates he traveled in Holland, France, and Italy. Influenced by Carrière and Whistler, he painted chiefly portraits and figures with appropriate interiors. His work possesses great harmony of color, form, and line and, though idealistic in conception, evidences profound study of nature. Among Sauter's paintings in public galleries are: "Friends" (Venice), "Music" (Brussels), "Interrogation and Hesitation" (Budapest), "Spring Mood" (Munich, replica at Leeds). His portraits include Max Müller (Oxford), Dr. Hans Richter (Budapest Gallery), Cardinal Rampolla, Prince Troubetskoy, and Mrs. Jungmann. In later life he also painted landscapes.

SAUTERNES, sō'tārn'. A village in the Department of Gironde, France, 27 miles by rail southwest of Bordeaux. It is situated in the famous white-wine-producing region of southwest France and gives its name to the best brands. Pop., 1901, 934; 1911, 1273.

SAUVEUR, sō'vēr', ALBERT (1863–). An American metallurgist, born at Louvain, Belgium. He studied at the Liége School of Mines in 1881–86 and, after coming to the United States, graduated in 1889 from the Massachusetts Institute of Technology. Until 1897 he was chemist and metallurgist of various steel companies and thereafter till 1905 was proprietor of the Boston Testing Laboratories. He lectured on metallography at the Institute of Technology from 1898 to 1903 and at Harvard taught metallurgy from 1899, becoming professor in 1905. In 1913 he received the Elliott Cresson gold medal of the Franklin Institute. Sauveur edited the *Metallographist* from 1898 to 1903 and the *Iron and Steel Magazine* in 1903–06. He is author of *The Metallography of Iron and Steel* (1912) and *Germany and the European War* (1915).

SAV'AGE, EDWARD (1761–1817). An American portrait painter and engraver. He was born in Princeton, Mass., and at first worked as a goldsmith, also practicing engraving. Although seemingly untrained in painting, he came into prominence in 1790 through his portrait of Washington, intended as a gift to Harvard University. In 1791 he visited London, where he studied for a time under West, and then went to Italy. Upon his return to the United States in 1794, he practiced in Philadelphia and New York, maintaining for several years a picture gallery and art museum in Water Street, New York. He completed the first representation of "Congress Voting Independence" (Pennsylvania Historical Society), begun by Robert Edge Pine. The portraits of Anthony Wayne, Dr. Rush, and Thomas Jefferson are good examples of his mezzotint engravings, which are highly esteemed. He is principally known, however, by a large portrait group, "The Washington Family" (1796), comprising George Washington, his wife, and two of the latter's grandchildren, in the collection formed by Wm. F. Havemeyer, New York. Consult C. H. Hart, in *Proceedings of the Massachusetts Historical Society* (Boston, 1905).

SAVAGE, Henry Wilson (?–). An American theatrical manager. He was born in New York City and graduated from Harvard in 1880. He became president of the Henry W. Savage Company, Inc., and of the Castle Square Opera Company of Boston, and director of the National Association of Theatrical Producing Managers of America. His more notable productions include *The Prince of Pilsen, The Girl of the Golden West, The Merry Widow, The Chocolate Soldier, Everywoman* (1913–14), and *Mr. Wu* (1914).

SAVAGE, James (1784–1873). An American political leader and antiquary, born in Boston, Mass., and educated at Harvard. He was a member of the State Executive Council, of the Constitutional Convention of 1820, and, at different times, of both branches of the Legislature. He founded and was successively secretary, treasurer, vice president, and president of the Boston Provident Institution for Savings. Among his publications are editions of John Winthrop's *History of New England from 1630 to 1649* (1825–26 and 1853) and a valuable *Genealogical Dictionary of the First Settlers of New England* (1860–64). Consult Hilliard, *Memoir of the Hon. James Savage* (Boston, 1878).

SAVAGE, Minot Judson (1841–1918). A Unitarian clergyman. He was born at Norridgewock, Me., entered Bowdoin College, but left before the end of his course, and pursued his theological studies at Bangor Seminary. Commissioned by the American Home Missionary Society in 1864, he spent the three following years at San Mateo and Grass Valley, Cal., then settled at Framingham, Mass., but removed to Hannibal, Mo., in 1869. His views underwent so decided a change that he at length withdrew from the Congregational church and in 1873 became pastor of the Third Unitarian Church of Chicago. The next year he was called to the Church of the Unity in Boston and remained there until 1896, when he became minister at the Church of the Messiah in New York City, which pastorate he resigned in 1906 on account of ill-health. He wrote: *The Religion of Evolution* (1876); *The Morals of Evolution* (1880); *Belief in God* (1881); *Beliefs about Man* (1882); *Beliefs about the Bible* (1883); *Social Problems* (1886); *My Creed* (1887); *Jesus and Modern Life* (1893); *Life Beyond Death* (1899); *The Passing and the Permanent in Religion* (1901); *Out of Nazareth* (1904); *America to England, and Other Poems* (1905); *Life's Dark Problems* (1905).

SAVAGE, Richard (?–1743). An English poet, who was, according to the current legend, an illegitimate son of Richard Savage, Lord Rivers, by the Countess of Macclesfield. The Countess, while living apart from her husband, Charles Gerard, second Earl of Macclesfield, bore to Lord Rivers two children—a daughter, who died in infancy (1695), and a son, christened Richard Smith (Jan. 18, 1697), who seems to have died the year of his birth. The Earl obtained a divorce from his wife (1698), who married (1700) Col. Henry Brett (died 1724). The poet, Richard Savage, probably of obscure birth, openly claimed to be the son christened Richard Smith. According to the usual story, to which Dr. Johnson gave currency in his famous *Life of Savage* (1744), the child, neglected by the Countess, was committed to a nurse and afterward to her mother, Lady Mason, who sent him to a grammar school at St. Albans. The Countess prevented Lord Rivers from leaving him £6000, attempted to have him kidnaped and sent off to the West Indies, and finally in despair apprenticed him to a London shoemaker. An accident revealed the secret of his birth, and the boy quitted his obscure trade. The entire account was derived solely from Savage's own statements and is now wholly discredited. Savage profited by the legend. In 1727 Savage killed a man in a tavern brawl and was sentenced to death, but a pardon was obtained by the intercession of the Countess of Hertford. Lord Tyrconnel, a nephew of Mrs. Brett, received him into his household. In the course of time the two men quarreled, and Savage was thrown upon the world. On the death of Laurence Eusden (1730), Savage tried to obtain the laureateship, but failed. Two years after the death of the Queen a pension of £50 was raised for him by Pope and others (1739), and Savage was sent off to Swansea in Wales. His works comprise: *Woman's a Riddle* (performed in 1716); *The Convocation* (1717), a poem; *Sir Thomas Overbury: A Tragedy* (1723); *The Bastard* (1728), a poem; *The Wanderer* (1729), a poem. A complete edition of his works appeared in London in 1775.

SAVAGE-ARMSTRONG, George Francis. See Armstrong, George Francis Savage.

SAVAGE ISLAND. See Niue.

SAVAGE LANDOR, A. Henry. See Landor, A. Henry Savage.

SAVAGE'S STATION, or **ALLEN'S FARM,** Battle of. A battle fought near Savage's Station, about 10 miles east of Richmond, Va., on June 29, 1862, during the Peninsular campaign of the Civil War, between a part of McClellan's Federal Army of the Potomac, under Generals Sumner and Franklin, and a part of Lee's Confederate Army of Northern Virginia, under General Magruder. It was one of the Seven Days' Battles (q.v.) fought by General McClellan during his change of base from the York to the James River. After the battle of Gaines's Mill (q.v.) Generals Heintzelman, Sumner, and Franklin were directed by McClellan to hold the Federal lines immediately south of the Chickahominy. This force was weakened on the 29th by the withdrawal of Heintzelman across White Oak Swamp and by the retirement of Slocum's division of Franklin's corps, which had suffered severely at Gaines's Mill. On the same day Magruder, expecting to be supported by Jackson, who had been ordered to cross the Chickahominy at Sumner's Upper Bridge and strike the Federal right flank, but who had been unavoidably delayed, attacked the Federal force with great energy, first at Allen's Farm and then at Savage's Station, but was finally repulsed. The Federals, however, withdrew across White Oak Swamp during the night, leaving to the Confederates 2500 sick and wounded men, with 500 attendants, in the field hospital at Savage's Station. Consult Johnson and Buel (eds.), *Battles and Leaders of the Civil War*, vol. ii (New York, 1887), and Webb, *The Peninsula* (ib., 1881).

SAVAII, sä-vī'ē. The largest and westernmost of the Samoan Islands (q.v.) (Map: Australasia, L 4). It is over 40 miles long and has an area of 660 square miles. It is mountainous and covered with craters. The highest peak of the island as well as of the

group is Mua (4000 feet). The coasts are mostly precipitous and inaccessible, the only space of anchorage being Matautu in the north. The interior is densely wooded and uninhabited, but there are stretches of fertile land along the coasts. Pop., 1910, 12,816.

SAVANNA. See SAVANNAS.

SAVANNA, sȧ-văn'ȧ. A city in Carroll Co., Ill., 138 miles west by north of Chicago, on the Mississippi River and on the Chicago, Milwaukee, and St. Paul and the Chicago, Burlington, and Quincy railroads (Map: Illinois, D 1). There are storage and cleaning elevators and a sash and door factory. Pop., 1900, 3325; 1910, 3691.

SAVAN'NAH. The second largest city of Georgia and the county seat of Chatham County, on the west bank of the Savannah River, 18 miles from the Atlantic Ocean (Map: Georgia, E 3). Geographically and commercially it enjoys a position of unusual advantage; historically it is one of the most interesting cities of the South. The climate, greatly influenced by the Gulf Stream, is mild and pleasant. In summer the heat of the day is followed by the cool breeze that prevails at night. The average temperature is 66° F. Savannah, situated on a plateau 50 feet above sea level, is laid out on a plan largely following that originally projected by Oglethorpe. The streets, broad, straight, and luxuriantly shaded, cross each other at right angles. The number of trees—magnolias, palmettos, japonicas, magnificent oaks, crape myrtles—and their beauty have given Savannah the name Forest City. The squares, originally intended as rallying places for the colonists, are especially noteworthy. A handsome monument to the Confederate dead stands in the Parade Ground, the southern extension of Forsyth Park. Other monuments are in honor of General Oglethorpe, Gen. Nathanael Greene, William Washington Gordon (one of the leaders, with Thomas Purse, W. T. Williams, W. H. Cuyler, and others, in the building of the Central of Georgia Railway), Sergeant William Jasper, and Count Casimir Pulaski. The city limits have been largely extended in more recent years.

The more imposing public buildings include the post office, the customhouse, the county courthouse, the city hall, the Telfair Academy of Arts and Sciences, the public libraries, and the municipal auditorium. The church edifices are numerous and handsome. There are good private schools, besides an efficient public-school system. Telfair Hospital for Women, Savannah Hospital, Oglethorpe Sanitarium, Park View Sanitarium, St. Joseph's Hospital, and the Georgia Infirmary for Colored People are prominent institutions. Near the city are Tybee Island beach and other salt-water resorts, largely frequented in summer and winter.

Savannah is surrounded by a fertile territory adapted to the cultivation of cotton, sugar cane, vegetables, and fruits. Four great railway lines enter the city—the Atlantic Coast Line, the Seaboard Air Line, the Southern, and the Central of Georgia. Regular steamship lines operating the largest coastwise steamships on the Atlantic coast give almost daily connection with New York and semiweekly connection with Boston, Philadelphia, Baltimore, and Jacksonville, Fla. Facilities for the expeditious handling of ocean and coastwise freights in large quantities have made the city the most prosperous of South Atlantic ports. Large ocean carriers leave port drawing 28 to 30 feet, and the channel is being constantly improved by the government. The terminals of the railroads and steamship companies afford the most modern facilities for the economical handling of freight. Savannah has long been the first cotton port on the South Atlantic coast and one of the first naval-stores ports in the world. Its exports of lumber are large, and there is much foreign trade in cotton-seed products. Total foreign commerce (1915) was $67,908,929, ranking Savannah as one of the larger Atlantic ports. Though it is preëminently a shipping centre, varied manufacturing is carried on. There are large railroad car and repair shops, fertilizer manufactories, foundries and machine shops, cotton-seed-oil mills, lumber mills, etc. In 1914 about $10,247,000 was invested in local manufacturing interests, the annual value of products aggregating over $6,709,000.

The government is vested in a mayor and a board of aldermen, elected every four years. Most of the administrative officers are chosen by the city council, the park and tree commissioners, however, being nominated by the mayor and confirmed by the council. The board of education is in a large degree a self-perpetuating body, entirely removed from partisan politics.

Pop., 1800, 5146; 1850, 15,312; 1860, 22,292; 1870, 28,235; 1880, 30,709; 1890, 43,189; 1900, 54,244; 1910, 65,064; 1915 (est.), with extended limits, 85,000; 1920, 83,252.

Savannah was settled in 1733 by a small company under the leadership of Gen. James Edward Oglethorpe. (See GEORGIA.) During the next few years a considerable number of German, English, and Scottish immigrants arrived, among them (in 1735) being Charles and John Wesley. During the Revolutionary War Savannah was fortified by the Americans, and in December, 1778, when occupied by a force of less than 1000 under Howe, it was attacked and captured, December 29, by 3000 British under Colonel Campbell. In the fall of 1779 an allied army of French and American troops under D'Estaing and Lincoln attempted to recapture it, but were repeatedly repulsed, and in the disastrous attack of October 9 the allies lost more than 800 men, Count Pulaski and Sergeant Jasper being mortally wounded. Savannah was incorporated as a city in 1789. In 1796 and again in 1820 it was ravaged by fire, the loss being more than $1,000,000 in the first case and more than $4,000,000 in the second. The first steamship to cross the Atlantic was owned and projected in Savannah, was named after the city, and sailed from this port (in 1819) on its voyage to Liverpool. On Dec. 10, 1864, General Sherman reached Savannah, thus completing his famous march to the sea. The city, then having a population of about 25,000, was defended by General Hardee with a Confederate force of 18,000; but Sherman captured Fort McAllister (q.v.) on the 13th, and on the 20th, while the Federal army was preparing to open siege operations on all sides, Hardee hurriedly withdrew by means of a pontoon bridge, destroying the navy yard with the ironclad ram *Savannah,* but leaving 150 heavy guns, large quantities of ammunition, and some 30,000 bales of cotton. Sherman left late in January on his march through the Carolinas, but Savannah was held by a Federal garrison until the close of the war. Consult: *Siege of Savannah in 1779* (Albany, 1866); Lee and Agnew, *Historical*

Record of Savannah (Savannah, 1869); C. C. Jones, Jr., and others, *History of Savannah to the Close of the Eighteenth Century* (Syracuse, 1890); and histories of Savannah by William Harden and Thomas Gamble, Jr.

SAVANNAH BLACKBIRD. See ANI.

SAVANNAH RIVER. A river forming the boundary between Georgia and South Carolina. It rises in the Blue Ridge and flows southeast, entering the Atlantic Ocean through the Tybee Roads, after a course of 450 miles (Map: Georgia, E 3). Its upper course is rapid, and the river carries a great deal of silt, which is deposited near its mouth in low islands and spits, dividing the river into narrow channels. Its principal tributaries are the Tallulah, Seneca, and Broad rivers. The main stream is called the Tugaloo above the Seneca and the Chattooga above the mouth of the Tallulah. It is navigable to Augusta, 230 miles.

SAVANNAS, sȧ-văn′ȧz (OSp. *savana,* sheet, from Lat. *sabanum,* from Gk. *σάβανον,* linen cloth, towel). Plant societies intermediate between forests and grasslands and associated with transitional conditions. Climatic savannas, which are abundant in many tropical and warm regions, are parklike, the undergrowth being largely grassy and the trees scattered irregularly. Occasionally edaphic savannas, probably influenced by the grazing of animals, may occur in temperate regions, especially in river bottoms.

SAVARY, sȧ′vȧ′rē′, ANNE JEAN MARIE RENÉ, DUKE OF ROVIGO (1774–1833). A French general, born at Marcq (Ardennes). In 1797 he accompanied Desaix to Egypt, and after Marengo (1800) Napoleon made him a colonel and aid-de-camp. In 1802 he became general of brigade and was made chief of the secret police; in 1804 he presided at the execution of the Duke d'Enghien. In the wars of 1806–07 he acquired high military reputation by his brilliant victory at Ostrolenka (Feb. 16, 1807). He distinguished himself also at Friedland (June 14, 1807), and was created Duke of Rovigo in the beginning of the following year. He was then sent to Spain by the Emperor and negotiated the arrangements by which Joseph Bonaparte became King of Spain. In 1810 Savary replaced Fouché as Minister of Police and held office until 1814. After the fall of Napoleon he was confined by the British government at Malta for seven months, when he succeeded in making his escape and landed at Smyrna. He returned to Paris in 1818 and was reinstated in his titles and honors. In 1823 he removed to Rome, having given offense to the court by his pamphlet *Sur la catastrophe de Mgr. le Duc d'Enghien,* in which Talleyrand was charged with the responsibility for the Duke's death, but at the close of 1831 he was recalled by Louis Philippe and appointed commander in chief of the Army of Africa. His *Mémoires* (Paris, 1828) are valuable for the Napoleonic period.

SAVE, säv (Ger. *Sau*). A tributary of the Danube. It rises in the northwestern part of the Austrian Crownland of Carniola and flows southeast and east through Croatia and along the southern borders of Slavonia, which it separates from Bosnia and Servia till it joins the Danube at Belgrade, after a course of about 450 miles (Map: Austria, E 4). In its lower course it is a sluggish stream, winding between marshy banks, while its shoals and variable volume render navigation difficult. It is, however, navigable for steamers as far as Sissek, 365 miles. It receives its principal tributaries from the right. These include the Kulpa, Unna, Vrbas, Bosna, and Drina.

SA′VERY, THOMAS (c.1650–1715). An English inventor, born in Shilstone, Devonshire. He became a military engineer, but devoted himself to mechanical inventions, devising a machine for polishing plate glass in 1696 and in the same year a pair of paddle wheels worked by a capstan set between them on a boat, a scheme described in a pamphlet *Navigation Improved* (1698; reprinted in 1858 and in 1880). But his fame rests on the steam pumping engine which he patented in 1699 and which was the first to come into practical use, especially in the improved form it took after the association of Savery with Newcomen (q.v.). Savery wrote *The Miner's Friend* (1698), which contains a description of his engine.

SAVIGLIANO, sä′vē-lyä′nō. A town in the Province of Cuneo, Italy, on the Maira, 32 miles by rail south of Turin (Map: Italy, A 2). It is surrounded by walls and has a triumphal arch. There are a technical school and a library. Savigliano manufactures railway material, wagons, silks, linens, and sugar and trades in cattle, hemp, and fruit. Here in 1799 the allied Russians and Austrians defeated the French. Pop. (commune), 1901, 17,321; 1911, 18,934, (town) 9902.

SAVIGNY, sȧ′vē′nyē′, FRIEDRICH KARL VON (1779–1861). One of the most distinguished of modern European jurists, the founder of the modern historical school of jurisprudence. He was born at Frankfort-on-the-Main, a descendant of an ancient family of Lorraine. He studied at Marburg (1795–1808), taught there, at Landshut (1808–10), and at Berlin (1810–42). In 1842 he ceased to teach and became a member of the Prussian Ministry, his especial charge being the preparation of legislative measures. In 1848 he retired to private life. In 1803 he published a treatise on the *Law of Possession* (*Recht des Besitzes*) which gave him a European reputation. An English translation by Sir Erskine Perry appeared in London in 1848. In 1814, in reply to a pamphlet by Thibaut, advocating the preparation of a code of laws for Germany, he published his *Vocation of our Time for Legislation and Jurisprudence* (*Beruf unserer Zeit für Gesetzgebung und Rechtswissenschaft*). Of this an English translation by Abraham Hayward was published in London in 1831. In his essay he took the ground that German legal science was not sufficiently developed to warrant such an undertaking, but he also set forth the limitations and the perils of codification with a precision and force that have not been excelled. In insisting that law is a product of the life of each nation he gave to the historical school of jurisprudence its theoretical basis. In 1815, in coöperation with other jurists, he established the *Zeitschrift für geschichtliche Rechtswissenschaft,* which continued to appear until 1850. Its modern successor is the *Zeitschrift der Savigny-Stiftung für Rechtsgeschichte.* Between 1815 and 1831 he published his *History of Roman Law in the Middle Ages* (*Geschichte des römischen Rechts im Mittelalter*), and between 1835 and 1853 his *System of Modern Roman Law* (*System des heutigen römischen Rechts*), which remained unfinished. Volumes i, ii, and viii of the latter work have been translated into English and published in Edinburgh (1867–94). His miscellaneous writ-

ings were collected and published in 1850. In addition to his services to historical jurisprudence Savigny did much to promote a more fundamental analysis of legal conceptions. Consult Roderich von Stintzing, *Friedrich Carl von Savigny: Ein Beitrag zu seiner Würdigung* (Berlin, 1862), and J. E. G. De Montmorency, in the *Journal of the Society of Comparative Legislation*, vol. xi (London, 1910).

SAVILE, săv'il, or **SAVILLE**, George, Marquis of Halifax (1633–95). An English statesman, born at Thornhill. He was a confidential adviser of Charles II, by whom he was created Earl of Halifax in 1679 and Marquis of Halifax in 1682. In the latter year he was also made Lord Privy Seal, the highest post in the realm. In this position he used his influence to oppose the ambition of James, Duke of York, and to advance the interests of the Duke of Monmouth. When James came to the throne he retained Savile among his advisers, but in a lower office, the presidency of the Council. He was, however, almost immediately dismissed from the Council because of his opposition to the repeal of the Test and Habeas Corpus Acts. When the storm broke over James, he attempted to conciliate the Marquis, who seems to have met the King's advances half-way. But, on the arrival of William, Halifax went over to him and, next to Somers, exercised the greatest influence in bringing about the new régime. He was again appointed Lord Privy Seal, but he gradually withdrew from political activity. His last years were spent almost entirely in literary work. In politics he was moderate and worked for what he believed to be his country's good. His numerous pamphlets are published in a volume entitled *Miscellanies by the Most Noble George Lord Savile, Late Marquis and Earl of Halifax* (London, 1700). Consult H. C. Foxcroft, *The Life and Letters of Sir George Saville* (2 vols., New York, 1898), and T. B. Macaulay, *History of England*, in Everyman's Library (ib., 1909).

SAVILE, săv'il, Sir Henry (1549–1622). An English classical scholar, born at Bradley in Yorkshire. He became fellow of Merton College in 1565. Subsequently he visited many places on the Continent, collecting manuscripts, and on his return was appointed Greek and mathematical tutor to Queen Elizabeth (1578), provost of Eton (1596), warden of Merton College (1585–1621). He founded at Oxford the Savilian professorships of geometry and astronomy and made liberal gifts to the university, including that of his valuable library. He wrote a translation of *The End of Nero and Beginning of Galba, fower Bookes of the Histories of Cornelius Tacitus; The Life of Agricola, with Notes* (Oxford, 1591); a folio edition of the *Rerum Anglicarum Scriptores post Bedam Præcipui* (Oxford, 1596); and a folio edition of the works of St. Chrysostom (8 vols., 1610–13). Consult J. E. Sandys, *A History of Classical Scholarship*, vol. ii (Cambridge, 1908).

SAVILLE, săv'il, Marshall Howard (1867–). An American archæologist, born at Rockport, Mass. He was a special student in anthropology at Harvard in 1889–94, engaged in field work under Prof. F. W. Putnam, and made important discoveries among the remains of the mound builders in southern Ohio. From 1894 to 1902 he was assistant curator of anthropology and in 1902–05 curator (later honorary curator) of Mexican and Central American archæology in the American Museum of Natural History, New York. After 1903 he was professor of American archæology at Columbia University. He also became director of an important private museum in New York, the Museum of the American Indian (Heye Foundation). Dr. Saville conducted many notably fruitful explorations—in Yucatan, Honduras, Mexico (Palenque, Mitla, Oaxaca), Ecuador, and Colombia. To the New International Encyclopædia he contributed articles in his special field.

SAVIN, săv'in, or **SAVINE** (OF., Fr. *sabine*, It. *savina*, from Lat. *savina*, savin, for *Sabina herba*, Sabine herb), *Juniperus sabina*. A low, much branched, widely spreading shrub, with small, imbricated evergreen leaves, mostly known as juniper, but sometimes called red cedar. It bears small black berries covered with a pale blue bloom and has strong-smelling aromatic leaves. It is a European plant which has long been confused with a similar North American species (*Juniperus horizontalis*, or creeping juniper).

SAVINGS BANK. An institution for the accumulation and profitable employment of small sums, chiefly the savings of the poorer classes. Savings banks originated in the philanthropic movement of the close of the eighteenth century. An institution of this nature was in operation in Hamburg in 1778; another was founded in Oldenburg in 1786. In England a savings bank was founded in London in 1798. In the first two decades of the nineteenth century such institutions were established throughout western Europe; in 1816 the first one in America was founded at Philadelphia, and by 1820 ten savings banks were in operation in the United States. Since that time such banks have increased steadily in number, until at present no civilized state is wholly without them.

Trustee Savings Banks. Early saving banks were all founded by philanthropists who acted simply as trustees for the depositors, giving their services gratuitously in managing the funds deposited with them. Practically the same plan is followed by most of the private savings banks of England and by the mutual savings banks of America. The system is, however, subject to fraud and reckless management—evils which are of a serious nature, since they check the tendency to save which the bank exists to develop. In many cases the government endeavors to minimize the risk of bad management by prescribing the classes of securities in which savings banks may invest. National, State, and municipal bonds and real-estate mortgages are favorite forms of investment in the United States.

Joint-Stock Savings Banks exist in large numbers, especially in the western part of the United States. Owing to the necessity of earning profits, it is impossible for these banks to make any great effort to secure very small deposits; hence their educational value is limited.

Savings Banks in the United States. The table on page 496 illustrates the growth of savings banks (mutual and joint-stock) in the United States.

The efficiency of a system of savings banks may be roughly measured by the ratio of accounts to the total population. By this test the American system does not prove wholly satisfactory. While the New England States show one account to two of the population, the Western States show only one to 18, the Middle

States one to 48, and the Southern States one to 406.

Municipal Savings Banks. Municipal action in encouraging saving began in Germany. A municipal savings bank was organized in Karlsruhe about the beginning of the nineteenth century, another was founded at Berlin in 1818. Institutions of this type are now found throughout Germany, operating in the country districts as well as in the towns. They are also the predominant type of bank in Austria and France, and the plan has been successfully employed in Italy, Switzerland, Russia, Denmark, Sweden, and Japan. It presupposes a highly efficient municipal government, and general confidence in the officials on the part of the lower classes. These banks are for the most part organized as quasi-private corporations, having power to own property, make binding contracts, and sue and be sued before the courts. Managers and officials are appointed by the municipality. In large cities the organization consists of a central office with branches located where they will be most convenient to wage earners. Sometimes these banks undertake to send officials to the homes of small depositors to collect weekly sums for deposit. These banks have proved highly successful, not only furnishing excellent facilities for saving, but also rendering available a supply of capital for local uses. Loans on real estate are the principal form of investment.

SAVINGS BANKS IN THE UNITED STATES

YEAR	Number of banks	Number of depositors	Deposits	Average due each depositor
1820.....	10	8,635	$1,138,576	$131.85
1840.....	61	78,781	14,051,520	178.54
1860.....	278	693,970	149,277,504	215.13
1880.....	629	2,335,582	819,106,973	350.71
1890.....	921	4,258,893	1,524,844,506	358.03
1900.....	1,002	6,107,083	2,449,547,805	401.10
1905.....	1,237	7,218,278	3,093,077,357	428.51
1914.....	2,100	11,109,049	4,936,591,849	444.36

Postal Savings Banks. See under that heading. The table below gives the chief facts with regard to savings banks in some of the more important modern nations:

COUNTRY	Year	Number of depositors	Total deposits	Average per inhabitant
United Kingdom	1912	14,251,527	$947,525,037	$19.66
France	1912	14,578,897	1,091,383,658	27.56
Germany	1912	22,979,254	4,445,833,574	67.73
Austria.....	1913	6,685,471	1,331,318,523	46.29
Russia	1913	8,988,225	867,929,500	5.17

Consult: H. W. Wolff, "Savings Banks at Home and Abroad," in *Journal of the Royal Statistical Society*, vol. lx (London, 1897); J. H. Hamilton, *Savings and Savings Institutions* (New York, 1902); Albert Hale, *Savings Bank Investments* (4th ed., Boston, 1908); "Sparkassen," in Conrad, *Handwörterbuch der Staatswissenschaften*, vol. vi (Jena, 1909–12); W. H. Kniffin, *The Savings Bank and its Practical Work* (New York, 1912); *Reports of the Comptroller of the Currency* (Washington, annually). See BANK, BANKING.

SAVITAR, sä'vê-tär (Skt., generator, stimulator). In Hindu mythology, the sun in his vivifying aspect. Eleven hymns of the Rig-Veda are in his honor, and his name is mentioned in all about 170 times. The preëminent characteristic of Savitar is his golden nature and equipment, his eyes, hands, tongue, and arms being of gold, while he is drawn by radiant steeds in a golden car. All these attributes, of course, typify the sun. Savitar is one of the most powerful of gods, but his power is uniformly beneficent. In the later Vedic period he comes to be identified, on account of the creative work of the sun, with Prajapati (q.v.). It is significant that the most holy verse of the Rig-Veda, the *Savitri* (q.v.), is in his honor. Savitar is no longer worshiped after the Vedic period. Consult: Muir, *Original Sanskrit Texts*, vol. v (London, 1872); Bergaigne, *Religion védique*, vol. iii (Paris, 1883); E. W. Hopkins, *Religions of India* (Boston, 1895); A. A. Macdonell, *Vedic Mythology* (Strassburg, 1897). See FUSAN; SURYA.

SAVITRI, sä'vê-trê (Skt., ray of light). The name of the most sacred verse of the Rig-Veda (iii, 62, 10), which may be translated "May we attain that longed-for Glory of Savitri the divine, that he may inspire our thoughts." It corresponds in sanctity to the first chapter of the Koran for the Mohammedans and to the Lord's Prayer for the Christians. It is addressed, as its name implies, to Savitar, the sun in his vivifying aspect. The Savitri is repeated by orthodox Brahmans at their morning devotions and at other times of special religious importance. Another Savitri figures as the heroine of one of the most beautiful episodes of the Mahabharata (q.v.). The episode has been edited and translated into German by Kellner (Leipzig, 1888 and 1896) and translated into English by Arnold in *Indian Idylls* (London, 1883). Consult Victor Henry, *Les littératures de l'Inde* (Paris, 1904).

SA'VO. See SAVONA.

SAVOFF, sä'vôf, MICHAEL (1857–). A Bulgarian soldier, born in Eastern Rumelia. He was educated at Robert College, Constantinople, in the military school at Sofia in 1878, and at the Academy of the General Staff, St. Petersburg, in 1881–85. In 1879 he was made a lieutenant general in the Eastern Rumelian army and in 1885 participated in the revolution that resulted in the union of Eastern Rumelia with Bulgaria. Later in the same year occurred the short decisive campaign against Servia, in which Savoff distinguished himself at Slivnitza, where he commanded the left wing of the Bulgarian army. He served as Minister of War under Stambolov in 1891–94, was sent to command the garrison at Shumla in 1897, and later was appointed chief of the Military Academy at Sofia. In 1903 he again became Minister of War and in the following year succeeded in having passed the famous law which resulted in the transformation of the entire nation into a fighting machine. For the next three years he was occupied in organizing the military forces, and he was responsible for the adoption of the Creusot gun in the artillery service. Savoff held chief command during the Balkan War in 1912–13 and showed the same great skill in the field that he had displayed as an organizer. Savoff was not prominent in the European War, for King Ferdinand had seen fit to place him, with other principal generals, on the retired list at army mobilization in 1915.

SAVOIE, sä'vwä' (Fr., for Savoy). A department of southeast France, bordering on Italy (Map: France, S., L 3). Area, 2388

square miles; pop., 1911, 247,890. It is in the region of the Alps, which reach in the Pointe Aiguille an altitude of 12,670 feet. The river Rhone forms the west boundary for 30 miles and with its affluent, the Isère, drains the department. The climate varies according to elevation and is bracing and healthful. Wheat, rye, maize, the grapevine, tobacco, mulberries, and apples are cultivated. There are important manufactures of cheese. Capital, Chambéry.

SAVOIE, HAUTE. A department of France. See HAUTE-SAVOIE.

SAVOIE-CARIGNAN, PRINCESS OF. See LAMBALLE, M. T. L. DE SAVOIE-CARIGNAN.

SAVONA, sä-vō'nä. A city in the Province of Genoa, Italy, situated on the Gulf of Genoa, 25 miles by rail west-southwest of Genoa (Map: Italy, B 2). It is a well-known Riviera (q.v.) city with fine boulevards and well-built modern houses. The sixteenth-century Renaissance cathedral contains some good paintings. Savona has a handsome theatre, an episcopal palace, a technical institute, and a school of navigation. There are also a library and a small picture gallery. The city has important iron and steel foundries and extensive potteries. Other manufactures are cloth, glass, leather, firearms, chemicals, and perfumery. Shipbuilding and fisheries are also carried on. Pop. (commune), 1901, 38,355; 1911, 50,051. Savona was known as Savo under the Romans. In the Middle Ages it was a prosperous maritime republic, but finally succumbed to Genoa.

SAVONAROLA, sä'vō-nä-rō'lä, GIROLAMO (1452–98). A noted Italian preacher and reformer. He was born at Ferrara, Sept. 21, 1452. He received a good education and entered the Dominican Order at Bologna in 1475. Fifteen years passed before he came prominently into public notice, and during that period he went through the usual routine of monastic life. From his youth his life was full of high moral enthusiasm and laborious study. In 1490 he went to the monastery of San Marco in Florence and began to preach sermons of such boldness and fervor that he immediately drew many hearers. Savonarola's nature was eminently one-sided; he was a religious enthusiast, who, seeing about him corruption and ill-doing, found the courage to raise his voice in reproach and in so doing suddenly secured a great popular response. From the pulpit in the church of San Marco, or of the Duomo near by, he would improvise, in hasty, emphatic fashion, vivid denunciations of the abuses of the day, of the licentiousness of the great, of the worldliness of the dignitaries of the Church; much of his preaching was mystical, prophetic, and apocalyptic. These denunciations possess one special feature that appeals particularly to the many for whom the history of Florence is chiefly the history of Italian art. Savonarola's brief period of influence came just as the earlier inspiration of the religious painters was dying out, just as the great Cinquecento period was dawning. His voice was raised loudly against the corrupting influences that were paganizing art, and it may be recalled that his influence was all-powerful with Botticelli, while the grief-stricken Fra Bartolommeo practically ceased to paint after the death of one he loved and looked on as a prophet.

Unfortunately Savonarola's rapid rise coincided with a period of great political disturbance. Florence, long a democratic republic, had passed under the sway of the Medici. Lorenzo the Magnificent, who died in 1492, had tried, but unsuccessfully, to win over Savonarola, whose denunciations were openly directed at the reigning house and its supporters. Two years after the accession of Lorenzo's son and successor, Piero, in 1494, Charles VIII of France invaded Italy at the head of a powerful army to assert a claim to the throne of Naples. Piero at first opposed the French, then treated, but displayed such weakness that his opponents took courage and rose, driving him from Florence. The Piagnoni (weepers) then came into power, a puritanical democratic party which had arisen in response to the preaching of Savonarola. His influence now dominated the government of the city, and, unfortunately for him, some of his eloquent appeals of former years were construed into a prophecy of the coming of the French. Events had proved him a true prophet, and the faith of the people in their preacher accordingly increased. His voice rose louder and still louder in denunciation of men and things. He aimed, in fact, at establishing an ideal Christian commonwealth. So great was his hold on those who listened to his preaching that for some months Florence was profoundly moved by religious enthusiasm and appeared a new city. The preacher's sway did not last long; he had set his standard too high, and the Florentines soon wearied of virtue. Reaction set in. The party of the Medici, known as the Arrabbiati (maddened), began to recover ground. Savonarola had extended the field of his attacks to the Pope, Alexander VI, who, inspired perhaps more by political than by religious motives, became hostile to the Dominican preacher.

In 1495 Savonarola was forbidden to appear in the pulpit for some months. Internal dissension in Florence provoked severe measures on the part of the Piagnoni against the Arrabbiati, and the popularity of the democratic party rapidly declined, as did that of Savonarola. The Pope summoned him to Rome, but he excused himself from going, knowing that it was a device of his enemies to end his labors. In 1497 the Pope excommunicated him, but Savonarola declined to accept the papal command and openly rebelled from the authority of the Pope. Shortly afterward the Arrabbiati won some measure of success in the city elections, and Savonarola was ordered to discontinue his preaching. A Franciscan friar was then put up to accomplish the Dominican's complete downfall and proposed as a test of their respective merits the ordeal by fire: the two champions were to pass down a long and narrow lane of fire between two lofty piles of blazing logs. Savonarola refused the challenge, but his enthusiastic disciples accepted it without hesitation. At last a friend, Fra Domenico, was permitted to offer himself for the test, but on April 7, 1498, when all Florence assembled to witness the trial, endless delays on the part of the Franciscans resulted in a fruitless adjournment. But the fickle favor of the populace was now gone. The Arrabbiati felt they could push their attack home. The convent of San Marco was attacked; Savonarola was imprisoned and tried for heresy and sedition. The trials, secular and religious, were long and accompanied by much torture, under which he broke down, but only to assert his innocence when the torture was remitted. On May 23, 1498,

he was hanged, and two other Dominicans with him, and their bodies were burned. In 1901 a tablet in his honor was erected by the city on the spot of his execution. Pastor declares, in his *History of the Popes*, that from the letter of the papal commissioners, May 23, 1498, it is evident that the charge of heresy in Savonarola's case is to be understood in the constructive, not in the strict, sense. His writings were numerous, an excellent selection from them being that by Villari and Casanova, *Scelta di prediche e scritti* (Florence, 1898). English translations are: *Exposition of Ps. li, xxxi* (London, 1900); *The Triumph of the Cross* (St. Louis, 1902); *Spiritual and Ascetic Letters of Savonarola* (London, 1907; new ed., 1909).

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SAVONNERIE, sȧ'vŏn'rē', La (Fr., soap factory). A carpet factory in Paris, established by Maria de' Medici in 1604 and combined with the Gobelins in 1826. Its name is derived from the use to which it was originally put.

SA'VORY (OF. *savoree, sadree, sadariege, saturige*, Fr. *savorée*, from Lat. *satureia*, savory), *Satureja*. A genus of annual or perennial herbs and subshrubs of the family Labiatæ, natives of southern Europe and the East. The common or summer savory (*Satureja hortensis*), an annual 6 to 12 inches high, with white or lilac flowers, commonly cultivated in kitchen gardens for flavoring food, has a strong agreeable aromatic smell and pungent taste. Winter savory (*Satureja montana*), a subshrub with prickly pointed leaves and larger flowers, is used in the same way. Summer savory is propagated by seed, winter savory usually by slips and cuttings. See Plate of Flowers.

SAVOU ISLANDS. See Savu Islands.

SAVOY, sȧ-voi' (Fr. *Savoie*). Formerly a duchy lying between Italy and France, subsequently a part of the Kingdom of Sardinia (q.v.), and since 1860 a part of France (Map: France, S., L 2). Savoy is situated in the region of the western Alps. It borders on the north on Lake Geneva, and on the west it is bounded partly by the Rhone, whose affluents drain the region. In the southeast the Graian Alps form a great wall on the side of Piedmont. The summit of Mont Blanc, the highest peak of the Alps, is within the borders of Savoy. There are several lakes, among them Bourget and Annecy, and a number of mineral springs, the most noted being those of Aix-les-Bains, Saint-Gervais, and Evian. The inhabitants, Savoyards, are essentially French. The largest town in the region is Chambéry. The region constitutes the departments of Savoie and Haute-Savoie (qq.v.). Savoy was included in the Roman provinces of Gallia Transpadana and Gallia Narbonensis. It was overrun in the early part of the fifth century A.D. by the Burgundians, who in 534 came under the domination of the Franks. Its subsequent history is best traced under Burgundy, and from the beginning of the eleventh century under Savoy, House of. Consult Arnold van Gennep, *La Savoie* (Paris, 1913), and Guido Rey, *Peaks and Precipices* (New York, 1915).

SAVOY, sȧ-voi'. See Old Hundred.

SAVOY, House of. The oldest reigning family in Europe, a cadet branch of which, that of Savoy-Carignan, occupies the throne of Italy. The house was founded by Humbert (fl. c.1003–c.1056), who was constable of the Emperor Conrad II. He seems to have received from Rudolph III, last King of Arles, the territories, partly French and partly Italian, which formed the nucleus of the little subalpine State of Savoy, and with these the title of Count. His loyalty to Conrad, who annexed the Arletan dominions to the Holy Roman Empire, gained for him additional territories and Imperial recognition of his title. His son Odo (died c.1060) succeeded to the title, and by his marriage with Adelaide, Countess of Turin, he greatly extended his dominions. In the succeeding three centuries the possessions of the family were largely extended in Piedmont and parts of Switzerland came under its sway. In the thirteenth century the house was divided into a Savoyard and a Piedmontese line. Amadeus VI of Savoy (1343–83) was a vigorous and able ruler. Amadeus VII (1383–91) secured Nice and thus gave Savoy an outlet to the sea. Amadeus VIII (1391–1440), by his support of the Emperor Sigismund, secured the erection of Savoy into a duchy (1416). In 1434 he handed over much of his authority to his son Louis and retired to a hermitage. Five years later, although he was not a priest, he was elected Pope by the "rump" Council of Basel as Felix V (q.v.), but he was not recognized by the Church at large.

At the time of the Reformation the authority of the dukes of Savoy over Geneva came to an end, and they were dispossessed of their Swiss territories. During the wars between the Emperor Charles V and Francis I of France, the latter in 1535 seized the dominions of the house of Savoy, which were not restored until the Treaty of Cateau-Cambrésis, when they were

handed over to Emmanuel Philibert (1559); this able and energetic Prince, the victor of Saint-Quentin (q.v.), restored the broken prosperity of the country and did away with the Austrian and French factions. His son, Charles Emmanuel I (1580–1630), called the Great, who married a daughter of Philip II of Spain, was engaged in long wars with France, which allowed him to retain the strategically important Saluzzo, which he had conquered only at the cost of considerable territory beyond the Rhone. At the close of his reign he engaged in the War of the Mantuan Succession, in which Savoy was an ally of the Hapsburgs against Louis XIII. The contest was terminated soon after the accession of Victor Amadeus I (1630–37), who renewed the alliance with France and in 1631 received part of Montferrat, but was forced to surrender the important fortress of Pinerolo and other places to France. Victor Amadeus I did much for the internal improvement of the country and reorganized the University of Turin. This brief reign was followed by minorities and regencies during which the state formed a buffer between France and Spain and suffered at the hands of both. Victor Amadeus II (1675–1732) married a niece of Louis XIV and was compelled for a time to submit to the demands of the French King, who forced him to persecute the Waldenses and finally, by imposing humiliating requirements upon him, drove him in 1690 into the Grand Alliance. In 1696 a treaty very favorable to Savoy detached the duchy from the Grand Alliance. Victor Amadeus II entered the War of the Spanish Succession as the ally of France and was placed in command of the combined French and Spanish armies. He was defeated at Chiari in 1701 by his cousin, Prince Eugene of Savoy. In 1704 the Duke gave up the French alliance and joined Austria. The French under Vendôme then overran and devastated Piedmont, but after Vendôme's recall they were routed by the Duke and Prince Eugene under the walls of Turin, Sept. 7, 1706. Victor Amadeus II in the Treaty of Utrecht (1713) was accorded the possession of Sicily with the title of King. The alliance with Austria also added the remainder of Montferrat to Savoy. Sicily was exchanged in 1718 for Sardinia (which had been given to Austria), and Victor Amadeus II became King of Sardinia. (For the subsequent history of the house of Savoy, see SARDINIA, KINGDOM OF, and ITALY.) In 1831 the succession to the throne of Sardinia passed to Charles Albert of the line of Savoy-Carignan. (See CARIGNANO.) Charles Albert was followed in 1849 by his son Victor Emmanuel II, who in 1861 assumed the title of King of Italy. Victor Emmanuel in 1860 ceded Savoy and Nice to France. He was succeeded in 1878 by Humbert. The latter's son, Victor Emmanuel III, ruled after his father's death in 1900.

Consult: Victor de Saint-Genis, *Histoire de Savoie* (Chambéry, 1869), a comprehensive study, based on the sources, from the origins to 1860; Alfred Doneaud, *La maison de Savoie* (Paris, 1869); Alethea Wiel, *The Romance of the House of Savoy, 1003–1519* (New York, 1898); Edward Armstrong, "Tuscany and Savoy," in *Cambridge Modern History*, vol. iii (ib., 1904); C. W. Previté-Orton, *The Early History of the House of Savoy, 1000–1233* (Cambridge, 1912). See CAVOUR; CHARLES ALBERT; ITALY; VICTOR EMMANUEL II; HUMBERT I; VICTOR EMMANUEL III.

SAVOY, THE. A chapel in London, on the Thames, occupying the site where once stood the palace built in 1245 and given to Peter, Earl of Savoy and Richmond. In this building the French King John II was imprisoned after his capture at the battle of Poitiers in 1356 and died in 1364. The palace was twice the object of popular violence. It narrowly escaped destruction in an outbreak caused by the Duke of Lancaster's protection of Wiclif, and in Wat Tyler's insurrection it was burned. In 1505 Henry VIII erected on the ruins a house for the support of destitute, diseased, and homeless persons. This charity soon became a refuge for the dissolute and vicious. It was suppressed by Edward VI, but restored by Queen Mary and refurnished by the ladies of her court, but in its management abuses prevailed. Its officials embezzled the funds, and the inmates continued to come from the degraded and criminal classes. The combined hospital and poorhouse maintained a nominal existence under the reign of Queen Anne. In building the Waterloo Bridge in 1810 the deep foundations on which the ancient buildings had rested were all removed. Nothing remained but the chapel built alongside these ruins by Henry VII. This chapel was made a church by Queen Elizabeth and was one of the chapels royal, under the name of St. Mary-le-Savoy. It was injured by fire in 1864, but was rebuilt for public worship by Queen Victoria. The vaults beneath contain the remains of many persons of distinction. Consult W. J. Loftie, *Memorials of the Savoy* (London, 1878).

SAVOY-AOSTA, PRINCE LUIGI AMEDEO OF. See ABRUZZI, PRINCE LUIGI AMEDEO OF SAVOY-AOSTA, DUKE OF THE.

SAVOY CONFERENCE. The name given to an ecclesiastical conference held in 1661 at the Savoy Palace, London, between the Episcopalian and Presbyterian divines, with the view of ascertaining what concessions would satisfy the latter and lead to "a perfect and entire unity and uniformity throughout the nation." During the rule of Cromwell the Church of England had been in a very anomalous condition. Most of the clergy who held office during the early period of the civil wars were strong Royalists and either were ejected or fled when the cause of the Parliament triumphed. Their places had been supplied in many cases by zealous Presbyterians, and thus it happened at the restoration of Charles II that a considerable section of the ministers within the church were hostile to the reintroduction of Episcopalian order and practice. Aware of this feeling, yet desirous of not adopting severe measures, if such could possibly be avoided, the King issued letters patent dated March 25, appointing 12 bishops, with nine clergymen as assistants on the side of the Episcopal church, with an equal number of Presbyterian divines, "to advise upon and review the Book of Common Prayer." Consult the "Order for the Savoy Conference," in Gee and Hardy, *Documents Illustrative of English Church History*, pp. 588–594 (London, 1896). Richard Baxter, with the consent of the Presbyterian party, drew up a "reformed liturgy" which the Episcopalian commissioners would not look at. It was never used, but was republished by Prof. C. W. Shields, *Book of Common Prayer . . . as amended by Westminster Divines, 1661* (Philadelphia, 1867; new ed., New York, 1880). Finally, the parties separated without arriving at any conclusion. In

1662 the Act of Uniformity (q.v.) followed. Consult D. Neal, *History of the Puritans*, part iv (New York, 1863).

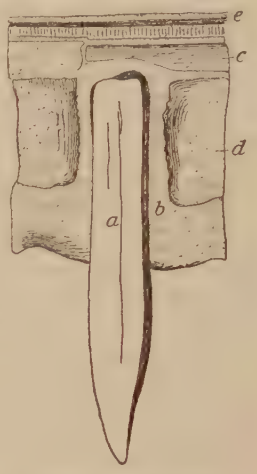
SAVU, sâ-vōō′ (or SAVOU) ISLANDS. A group of three islands in the Dutch East Indies, situated between long. 122° and 123° E. and lat. 10° 25′ and 10° 36′ S., southwest of Timor and southeast of Sandalwood (Map: East India Islands, F 8). The largest of the group, Great Savu, has an area of 208 square miles, and the entire group 231 square miles. The soil is fertile and produces rice, indigo, sugar, tobacco, etc. The population consists of Malays and once numbered nearly 40,000. The present estimate is 26,000, mostly on Great Savu.

SAW (AS. *saga*, OHG. *saga*, *sega*, Ger. *Säge*, saw; connected with Lat. *secare*, to cut, *securis*, axe). An important tool used in working timber and metal. The wood saw usually consists of a long strip of thin steel, with one edge cut into a continuous series of sharp teeth. The two chief classes of saws are crosscut saws and ripsaws. In the former the teeth are designed to cut at right angles to the fibre of the wood, while in the latter they are adapted to cutting in the direction of the fibre and are alternately bent or set so that they make a broader cut than the thickness of the blade. The handsaw has a blade broader at one end than the other, and a wooden handle fixed to the broader end. During the nineteenth century the circular saw, patented by Samuel Miller in England in 1777, came into universal use wherever machinery could be had for working it. It is generally so fitted as to be worked under a flat bench, a part only of the blade projecting through a narrow slit cut in the top of the bench. It is revolved with great rapidity, and the wood resting on the bench is pushed against the saw. Circular saws are made in diameters from 1 inch to 70 inches and are extensively used in sawing logs into boards, planks, and other forms of timber. (See SAW MILL; WOODWORKING MACHINERY.) The band saw was invented in 1808 by William Newberry, an Englishman. It consists of a very long band or web, as it is called, of steel, usually very narrow and with finely cut teeth. The two ends are joined together so as to form an endless band, which is passed over two revolving drums, one above and the other below the working bench, through holes in which the saw passes. The cylinder saw, or crown saw, is another variety, which was an invention of great antiquity. It is used for cutting curved staves for barrels, button blanks, sheaves, and other special forms. (See COOPERAGE.) For descriptions of saws for metal working, see METAL-WORKING MACHINERY.

SAWAII, sâ-vī′ê. The largest of the Samoan Islands. See SAVAII.

SAWDUST. A by-product obtained from saw mills and other woodworking machinery. Besides its uses as a packing material, a stuffing for dolls and cushions, and an absorbent covering for floors, such substances as vegetable charcoal, tar, oxalic acid, and wood alcohol are made from it. (See OXALIC ACID; ALCOHOL.) In making charcoal the sawdust from hard and soft woods must be kept separate, as the former requires much more intense heat than the latter. After careful sifting the sawdust is carbonized in fire clay, plumbago, or cast-iron retorts. The resulting charcoal is sifted to remove the calcareous matter which has been detached during the burning process. This charcoal is used to remove unpleasant flavors from wine and as a filtering medium, especially in distilleries. Sawdust may also be distilled by a process which not only saves the charcoal, but also furnishes such products as alcohol and tar. Fireproof tiles, or partitions, are also made from sawdust mixed with clay and afterward burned in a kiln, which consumes the sawdust, leaving the tiles in a porous and noncombustible condition.

SAW′FISH. One of the elongated sharklike rays of the family Pristidæ, remarkable for prolongation of the snout into a flat bony sword, armed on each edge with about 20 large bony teeth, a formidable weapon for killing prey among shoals of fishes, slaying them right and left. Whales are said to be killed by sawfishes occasionally, and the saw has been sometimes driven through the hull of a ship. About five species are known, living in the warm seas. One, the "pez sierra" of the West Indies, is common about Florida and in the Gulf of Mexico and ascends the Mississippi and other Southern rivers. It is often 15 feet long, a fourth of which measures the saw. It plays havoc with fishermen's nets. See Plate of LAMPREYS AND DOGFISH.



TOOTH OF A SAWFISH.

Section of the rostrum including one tooth (*a*); *b*, ossified part of rostrum; *c*, canal for vessels supplying the tooth; *d*, medullary cavity of rostral cartilage; *e*, granular skin or shagreen.

A family of sharks (Pristiophoridæ) similarly armed occurs in the Pacific Ocean.

SAW′FLY. A hymenopterous insect of the superfamily Tenthredinoidea, so named on account of the sawlike ovipositor of the female, which serves to drill holes in vegetable tissues and to assist in conveying the eggs into these holes. The saws are mechanically perfect tools. About 2000 species are known, most of which are found in temperate and cold regions. Many sawflies in the larval stage are highly injurious to vegetation. The largest of the common North American sawflies is *Cimbex americana*, whose eggs are laid in the leaves of the elm, birch, linden, and willow. See CURRANT INSECTS; LARCH SAWFLY; PEAR INSECTS; ROSE INSECTS.

SAW MILL. The mill or machine by which logs are sawed into boards and timber; by popular extension, the building, with its machinery, in which timber is sawed. The first form of saw mill was the sash-saw mill, whose general construction and operation are shown by Fig. 1. In this the saw, which is simply a properly toothed straight band of steel, is strained taut by means of the rectangular frame or sash, and this sash is given a vertical reciprocating movement between upright guide timbers by means of a connecting rod whose lever end extends to a crank on one end of an engine or water-wheel shaft. The log to be cut is fed endwise against the saw by means of a traveling carriage. In usual practice the sash-saw mill makes about

150 strokes per minute and produces about 2000 feet B. M. in 10 hours. The next development in saw mills was the invention of the

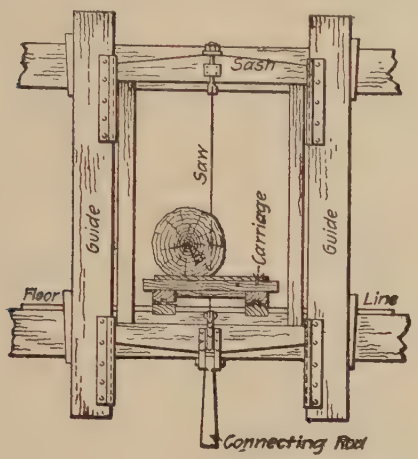


FIG. 1. SASH-SAW MILL.

muley-saw mill (Fig. 2), the chief merit of which, compared with the sash-saw mill, was the great reduction in the weight of the reciprocating parts. The saw is clamped to two light crossheads, one at each end, which work up and down, but is not strained or kept taut by tension as it was in the sash in the earlier sash-saw mill. To keep the saw straight in its movement, upper and lower guides, aided by the crossheads and the log itself, were depended upon. The muley-saw mill was followed by circular-saw mills.

In the circular-saw mill the saw is a circular disk of steel with teeth on its edge. This is mounted on a shaft which is given rapid rotary motion by gearing or belting operated by a water wheel or steam engine. The saw projects something less than half its diameter above the frame or carriage on which the log is placed and fed endwise against the teeth. The circular-saw mill gave a continuous cutting motion of from 6000 to 9000 feet per minute, with which great advantage, however, it combined a number of disadvantages. Its rigidity or capacity to maintain a true plane of rotation decreases with the diameter of the saw or, in other words, with the depth of cut, and this is obviously just the reverse of the requirements. The only way to increase its rigidity is to increase the thickness of the disk, and this means the cutting of a wider gash or kerf and a waste of a greater portion of the log in sawdust. All things considered, it was found impracticable to employ a circular saw much exceeding 6 feet in diameter. Less than half of this diameter is the cutting depth of the saw. To saw logs of greater diameter than about 2 feet, therefore, it is necessary to employ two saws—one mounted above so as to cut a kerf downward into the log and the other mounted in the ordinary way to cut a kerf upward to meet the kerf formed by the upper saw. It has been estimated by reliable authorities that the kerf waste with circular saws is about 20 per cent greater than with the band-saw mill, which succeeded them in the order of development.

The band-saw mill (Fig. 3) was known long before the circular-saw mill had come into general use, but its adoption was delayed for many years by the difficulty of making saws which would endure under the severe service. When once it was possible to secure durable saws, the development of the band-saw mill was exceedingly rapid, and it is now generally used for sawing timber in all countries where the lumber industry has reached a high plane of commercial importance. This mill consists of a frame or standard carrying two broad-faced wheels mounted one above the other. Over these wheels a continuous band of steel works exactly like a belt between two pulley wheels. This steel band is the saw, and the logs are fed endwise against its toothed edge by traveling carriages. In a modern band-saw mill the saw has a continuous cutting speed to 80,000 feet B. M. per day, and in one instance two band saws cut from 609 logs 339,313 feet of

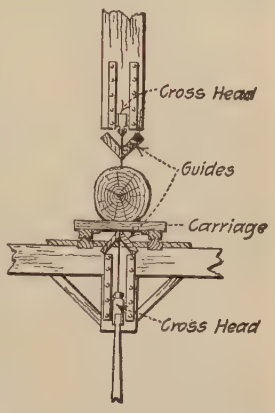


FIG. 2. MULEY-SAW MILL.

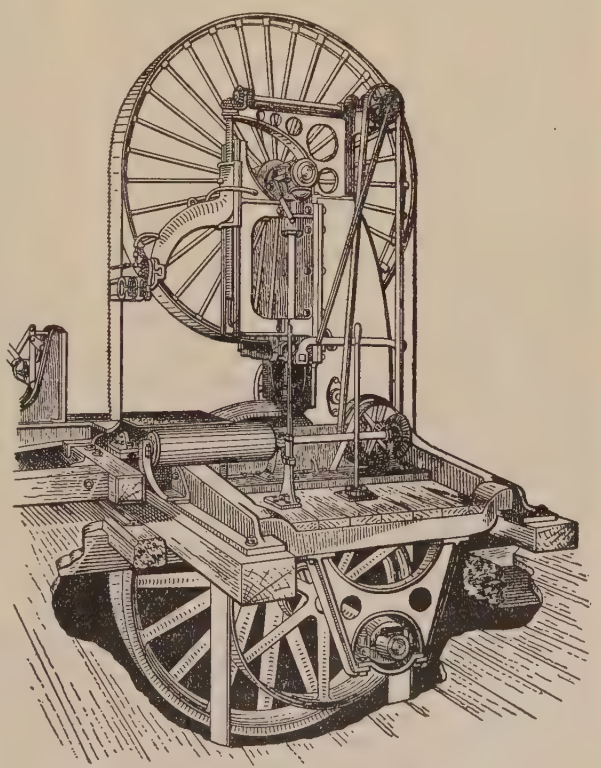


FIG. 3. AMERICAN BAND-SAW MILL.

timber. Band saws are made as large as 18 inches wide, passing around wheels 10 feet in diameter. In some of the largest mills as many as five band saws are grouped in a single gang with considerable effect.

The most recent development in saw mills is the gang-saw mill, and this has received its highest development in Europe, where the size of timber is smaller than in America. A gang-saw mill operates on much the same principle as the old saw mill illustrated in Fig. 1. Indeed, if we imagine the single saw of Fig. 1 to be replaced by a dozen or more parallel saws spaced equal distances apart, we have a very correct notion of a gang-saw mill, except that in modern construction the mill is a compact self-contained construction of iron and steel, which often is in one piece with the steam engine which operates it. The gang-saw mill usually operates on timber which has been roughly squared by band or circular saw mills, and its merit is, as is quite obvious, that it cuts the whole timber into boards in one passage through the mill. The forms of saw mills which have been described are specialized for such work as sawing shingles, clapboards, etc., by arranging and grouping the saws and by providing special carriages for automatically feeding the timber to the saws in such a manner as to produce the particular form of timber required. A saw-mill plant is a plant in which logs from the lumber camps are sawed into rough lumber. According to the thirteenth United States census there were in the United States, in 1909, 33,090 saw-mill and logging plants in operation. These plants represented a capital of $863,870,850, employed 547,148 wage earners, consumed raw material valued at $265,559,595, and turned out a product valued at $753,388,368. These statistics do not take into consideration the small custom mills primarily engaged in material owned by others, of which in 1909 there were 4133, with an aggregate capital of $5,655,145, with product valued at $4,515,881. See LUMBER INDUSTRY; WOODWORKING MACHINERY. Consult M. P. Bale, *Woodworking Machinery* (London, 1914), and files of the *American Lumberman* and catalogues of makers of woodworking machinery.

SAW'NEY. See NATIONAL NICKNAMES.

SAW VIPER. A small viper of the Old World deserts, marked with a dorsal series of light spots, and a zigzag line along each side suggesting the teeth of a saw. It is fierce, aggressive, and very poisonous, and it has the peculiarity of making a "curious, prolonged, almost hissing sound, by rubbing the folds of the sides of the body against one another, when the serrated lateral scales grate together." The most widely distributed species, called eja in Egypt, is *Echis carinata*, occurring from Morocco to northern India; a second species (*Echis colorata*) inhabits Arabia and Palestine. Consult authorities cited under VIPER.

SAW-WHET OWL. A small brown-streaked owl (*Nyctala*, or *Cryptoglaux*, *acadica*), without ear tufts, rather common in the northeastern States and Canada, so named from its curious rough cry. See Plate of OWLS.

SAW'YER, LEICESTER AMBROSE (1807–98). An American biblical scholar, one of the first advocates of the higher criticism in the United States. He was born in Pinckney, N. Y., studied at Hamilton College and at Princeton Theological Seminary, was ordained to the Presbyterian ministry in 1832, but, after having been pastor in New York, Connecticut, and Ohio, and president of Central College, Ohio, he was pastor of a Congregational church at Westmoreland, N. Y. (1854–59). Then joining the Unitarian church, he occupied a pulpit at South Hingham, Mass., for a year. In 1860 he removed to Whitesboro, N. Y., where he died. Sawyer abandoned the doctrine of verbal inspiration, retranslated the Bible, publishing the New Testament in 1858 and the prophetical books of the Old Testament in 1860, and wrote: *Elements of Biblical Interpretation* (1836); *Critical Exposition of Baptism* (1845); *Organic Christianity* (1854); *Reconstruction of Biblical Theories* (1862); *Final Theology* (1879).

SAWYER, SIR ROBERT (1633–92). An English lawyer. He was educated at Magdalene College, Cambridge, where he was a "chamber fellow" with Samuel Pepys, and became a barrister at Lincoln's Inn. In 1673 he was elected to Parliament and in 1677 was knighted. During his term as Attorney-General (1681–87) Sawyer conducted many important state trials, including the prosecutions of Stephen College and Lord Shaftesbury in 1681, proceedings against the charter of the city of London in 1682, the trial of the Rye House Plot cases in 1683, the prosecution of Sir Thomas Armstrong in 1684, and the trial of Titus Oates for perjury in 1685. In 1688 he was counsel for the defense of the seven bishops. He was expelled from the House of Commons in 1684, but was returned shortly afterward.

SAWYER BEETLE. See CERAMBYCIDÆ.

SAX, sāks, CHARLES JOSEPH (1791–1865). A Belgian-French instrument maker, born at Dinant-sur-Meuse. In 1815 he established himself in Brussels and soon became especially known for his brass instruments. After long investigation and experimentation he discovered the exact proportion for the scale of wind instruments most conducive to a full round tone. Together with his son, ADOLPHE (1814–94), he made many improvements in musical instruments. Adolphe perfected the clarinet and the bass clarinet and invented the saxophone (q.v.). Consult O. Comettant, *Histoire d'un inventeur du XIXme siècle* (Paris, 1860).

SAX'A RU'BRA (Lat., red stones). A station of the ancient Via Flaminia, 8 miles north of Rome, so called from the red volcanic tufa of the locality. Here Maxentius was defeated in 312 by Constantine I (q.v.).

SAXE, sāks, JOHN GODFREY (1816–87). An American humorous poet, born in Highgate, Vt. He graduated at Middlebury College, was called to the bar in 1843 and in 1850 bought the Burlington (Vt.) *Sentinel*, which he edited for six years. He then became Attorney-General of Vermont and deputy collector of customs. Later he was editor of the Albany (N. Y.) *Evening Journal*, wrote and lectured, and published verses in the *Knickerbocker Magazine* and *Harper's Weekly*. His works include: *Progress: A Satirical Poem* (1846); *Humorous and Satirical Poems* (1850); *The Money-King, and Other Poems* (1859); *Clever Stories of Many Nations Rendered in Rhyme* (1865); *The Masquerade, and Other Poems* (1866); *Fables and Legends of Many Countries* (1872); *Leisure-Day Rhymes* (1875). His verse abounds in burlesque and puns, and is light, sketchy, and whimsical, but there are not wanting poems of genuine human interest.

SAXE, såks, MAURICE, COUNT DE (1696–1750). A French marshal, born at Goslar, Germany. He was the illegitimate son of Augustus the Strong, Elector of Saxony and King of Poland, and the Swedish Countess Aurora von Königsmark. When only 12 years of age he joined the army of Prince Eugene and took part in the capture of Lille and the siege of Tournay. In 1711 he served with the Russo-Polish army before Stralsund. He took part in a campaign against the Turks in 1717, and in 1720 he went to Paris, where he studied military tactics and engineering. In 1726 he was elected Duke of Courland, but he incurred the enmity of both Russia and Poland and was compelled to retire to France in the following year. Joining the French army on the Rhine under the Duke of Berwick, he distinguished himself at the siege of Philippsburg (1734) and in the battle of Ettingen. For these services he was made a lieutenant general in 1736, and on the breaking out of the War of the Austrian Succession he obtained the command of the left wing of the French army which was appointed to invade Bohemia. He captured Prague and Eger (1741) and showed signal ability in the field and in 1744 was made a marshal of France and appointed to command the French army in Flanders. In the following year he laid siege to Tournay. On May 11, 1745, he met the combined forces of the English, Hanoverians, Dutch, and Austrians under the Duke of Cumberland at Fontenoy and won a decisive victory. During the four succeeding months every one of the strong fortresses of Belgium fell into his hands. On Oct. 11, 1746, Marshal Saxe gained the victory of Raucoux over the allied armies under Charles of Lorraine, for which he was rewarded with the title of marshal general of France, an honor which only Turenne had previously obtained. At Laffeld (July 2, 1747) the English army under the Duke of Cumberland was again defeated by Saxe, and the capture of the fortress of Bergen-op-Zoom brought the allies to think of peace. The Dutch, however, were still disposed to hold out, till the capture of Maestricht (1748) destroyed their hopes, and the Peace of Aix-la-Chapelle followed. Saxe died Nov. 30, 1750. Saxe's work on the art of war, entitled *Mes rêveries,* was published at Paris in 1757 and contains many novel and audacious ideas. In 1794 appeared his *Lettres et mémoires.* Consult De Broglie, *Maurice de Saxe et le Marquis d'Argenson* (Paris, 1891).

SAXE-ALTENBURG, säks'-äl'ten-bĕrg. A duchy and constituent state of the German Empire, consisting chiefly of two nearly equal parts, of which the western is situated between Saxe-Weimar and Reuss-Gera, and the eastern between Reuss-Gera and the Kingdom of Saxony. There are also a number of small exclaves. The total area is 511 square miles. The eastern part is broken somewhat by the offshoots of the Erzgebirge and has an undulating surface. The western part belongs to the region of the Thuringian Forest and is more mountainous. The Saale waters the western, and the Pleisse the eastern part. The latter portion is agricultural and very fertile. In the western part these conditions are less favorable, but the forests are an important source of income. Stock raising is well developed. There are considerable deposits of lignite. The chief manufactures are woolens, gloves, iron products, glassware, porcelain, and wooden ware. The Diet consists of 32 members, of whom 9 represent the most highly taxed citizens, 11 the towns, and 12 the rural communes. The members of the Diet are elected directly for three years. Saxe-Altenburg has one vote in the Bundesrat and returns one deputy to the Reichstag. Pop., 1900, 194,914; 1910, 216,128, chiefly Protestants. Capital, Altenburg (q.v.).

History. In the Middle Ages a part of the region now comprised within Saxe-Altenburg was an Imperial domain, until in 1329 it was acquired by the margraves of Meissen. Upon the division of the Wettin lands in 1485, Saxe-Altenburg fell to the Ernestine line, from which it passed after the War of the Schmalkald League (1546–47) to the Albertine branch. The elder house of Altenburg was founded in 1603 and became extinct in 1672. The greater portion of the land thereupon was united with Gotha. Upon the extinction of the ducal line of Gotha in 1825, Altenburg passed in the following year to Duke Frederick of Hildburghausen, who founded the new line of Saxe-Altenburg. In the revolutionary movements of 1830 and 1848 the rulers were forced to grant constitutional government. The duchy became a member of the North German Confederation in 1866 and of the German Empire in 1871.

SAXE-COBURG, -kō'bụrk, PRINCE OF. See JOSIAS, FRIEDRICH.

SAXE-COBURG-GOTHA, -gō'tȧ. A duchy and constituent state of the German Empire, consisting of the two duchies of Coburg and Gotha, the former bordering on Bavaria and the latter on Prussia. Area, 763 square miles. Both portions of the duchy belong to the region of the Thuringian Forest and are mountainous with well watered and wooded fertile valleys. Agriculture is the principal occupation, and considerable crops of cereals and potatoes are raised. The vine is cultivated to some extent in Coburg. Stock raising is also well developed. The manufactures comprise machinery, safes, small iron and steel ware, textiles, paper, buttons, leather, footwear, etc. Both duchies are well supplied with transportation facilities. The duchies of Coburg and Gotha have two separate Chambers of 11 and 19 members respectively, elected directly by restricted suffrage for four years. The common affairs of the two duchies are transacted by the two Chambers meeting in common, alternately at Coburg and Gotha. There is one ministry divided into two sections and presided over by the Minister of State. Saxe-Coburg-Gotha is represented by one member in the Bundesrat and returns two deputies to the Reichstag. Pop., 1900, 229,550; 1910, 257,177, mostly Protestants.

History. The town of Coburg was acquired about the end of the fourteenth century by the house of Wettin (see SAXONY), and upon the partition of the Wettin lands in 1485 it fell to the Ernestine line. In 1735 Coburg was acquired by the Duchy of Saxe-Saalfeld, which became the Duchy of Saxe-Coburg-Saalfeld, with Coburg as its capital. In 1826 Duke Ernest III ceded Saalfeld to Saxe-Meiningen, receiving Gotha in exchange, and henceforth called himself Ernest I of Saxe-Coburg-Gotha. The feudal constitution survived in Gotha down to 1849, when a liberal one was inaugurated. The connection between Coburg and Gotha was merely personal until 1852, when a constitution was enacted for both duchies, the union being further consolidated in 1874. Saxe-Coburg-Gotha

joined the North German Confederation in 1866 and in 1871 became a member of the German Empire.

SAXE-HILDBURGSHAUSEN, Prince of. See Joseph Friedrich Wilhelm.

SAXE-MEININGEN, mī'nĭng-en. A duchy and constituent state of the German Empire in Thuringia, extending in the shape of a crescent along the northern boundary of Bavaria (Map: Germany, D 3). Area, 953 square miles. It belongs principally to the region of the Thuringian Forest and has a hilly surface, watered by the Werra, the Saale, and some tributaries of the Main. Saxe-Meiningen is not well adapted for agriculture. The forests, which belong largely to the crown, and public foundations cover a considerable proportion of the area and yield material for the production of woodenware. The mineral products include slate, iron, and salt. Manufactures include glassware, cast-iron goods, textiles, leather, porcelain ware, papier maché toys, flour, cigars, etc. The Diet consists of 24 members, of whom 4 are elected by those paying the highest land and property taxes, 4 by those paying the highest income taxes, and 16 by the remaining citizens, for a term of six years. The duchy is represented in the Bundesrat by one member and in the Reichstag by two deputies. Pop., 1900, 250,731; 1910, 278,762, nearly all Protestants. Capital, Meiningen (q.v.).

History. The line of Saxe-Meiningen was founded in 1681 by Bernhard, the third son of Ernest the Pious of Saxe-Gotha. In 1826 Duke Bernhard added to his possessions the Principality of Saalfeld and most of Hildburgshausen, together with parts of Gotha and Coburg. In 1829 a constitutional form of government was established, and in 1848 a number of liberal reforms were introduced. Saxe-Meiningen became a member of the North German Confederation in 1866 and in 1871 of the German Empire.

SAXE-MEININGEN, Duke of. See Bernhard, Duke of Saxe-Meiningen.

SAXE-WEIMAR, -vī'mär, or Saxony. A grand duchy and constituent state of the German Empire in Thuringia, consisting of the three detached government districts of Weimar, Eisenach, and Neustadt, to which also belong 24 small exclaves. Area, 1394 square miles. The District of Weimar belongs to the Thuringian highlands; that of Eisenach is touched by the Thuringian Forests on the north and the Rhön Mountains on the south; the District of Neustadt has also a more or less hilly surface. The chief rivers are the Saale and the Ilm in Weimar, the Werra in Eisenach, and the White Elster in Neustadt. Agriculture is the chief occupation. The principal crops are rye, wheat, barley, oats, potatoes, hay and fodder, and various kinds of beets. Fruit and the vine are cultivated to some extent. Stock raising is an important industry, and the forests are exploited extensively. Industrially Saxe-Weimar occupies a very prominent position among the minor Saxon states. Crockery and pottery and various textiles, yarns, and hosiery are exported. Other manufactures are beet sugar, leather, paper, and woodenware. The constitution of the grand duchy dates from 1816, being the first liberal constitution in Germany. The Diet is composed of 38 members, of whom 5 are returned by the landed aristocracy, 5 by others of equal income, 5 by the University of Jena, chambers of commerce, etc., and 23 by the other citizens; the term is three years. The grand duchy has one vote in the Bundesrat and returns three deputies to the Reichstag. Pop., 1900, 362,873; 1910, 417,149, chiefly Protestants. The principal towns are Weimar (the capital), Eisenach, Apolda, and Ilmenau.

History. Weimar first appears in history in the tenth century as a possession of the counts of Orlamünde, from whom it passed to the house of Wettin. On the partition of the Wettin lands in 1485 Weimar passed to the Ernestine line. The elder line of Weimar was founded in 1572 by John William, Duke of Saxony, who died, however, in the following year. In 1603 followed the establishment of the younger line of Weimar by John, the son of John William. John died in 1605, and after a regency of some four years was succeeded by his eldest son, John Ernest, who in 1619 embraced the cause of the Elector Palatine Frederick against the Empire. (See Thirty Years' War.) John Ernest was succeeded in 1626 by his brother William, who in 1630 made common cause with Gustavus Adolphus. William's brother, Bernhard of Weimar (q.v.), became one of the most celebrated anti-Imperialist generals of the later part of the Thirty Years' War. In 1640 William made a division of the Weimar territories with his brothers, Albert and Ernest, and is thus considered as the founder of a new line of Saxe-Weimar. The ducal lands were partitioned in 1672 among the lines of Weimar, Jena, and Eisenach, of which the two latter became extinct in 1690 and 1741 respectively, their territories being united with Weimar. Under the celebrated Amalia (q.v.), Regent for her son Charles Augustus (q.v.), and under this enlightened Prince, Weimar became the great centre of German literature—the home of Goethe, Herder, Schiller, and Wieland, among others. At the Congress of Vienna in 1815, Charles Augustus received the title of Grand Duke, together with an increase of territory. A constitutional government was established in 1816, and in spite of the policy of repression enforced by the Federal Diet on the German princes under the inspiration of Metternich, the government system of Saxe-Weimar continued comparatively liberal. In 1866 it joined the North German Confederation and in 1871 became a member of the German Empire.

SAXE-WEIMAR, Bernhard, Duke of. See Bernhard, Duke of Saxe-Weimar.

SAX'HORN'. A brass wind instrument, invented by Adolph Sax in 1842, and named after him. Before that time the various brass instruments in use (flügelhorn, trumpet, natural horn, serpent, ophicleide, bugle) were not only deficient in compass, intonation, and quality, but, owing to differences in their mechanical construction, required different systems of fingering. To remedy these defects the saxhorn was constructed in various sizes and pitches with a compass from G_2 to a^1. A uniform system of fingering enables the same player to play any member of the group. The more common of the saxhorns are: the E♭ soprano and B♭ alto flügelhorn (high pitch); the E♭ tenor and B♭ baritone althorn (medium pitch); the B♭ euphonium, E♭ bombardon, and B♭ contrabass (low pitch). All are played by valve mechanism.

SAX'IFRAGA'CEÆ. A family of plants. See Saxifrage.

SAX'IFRAGE (Lat. *saxifraga,* maidenhair,

stone breaking, from *saxum*, rock + *frangere*, to break; so called because supposed to break stones in the bladder), *Saxifraga*. A genus of plants of the family Saxifragaceæ, including about 160 species of erect or decumbent, mostly perennial herbs, natives chiefly of mountainous tracts in north temperate and Arctic regions, sometimes at the limits of perpetual snow. The cultivated varieties, obtained from many different species, are commonly grown on rockeries. Some are densely tufted mosslike plants, which form a flowery turf. The most common wild species of the eastern United States are early saxifrage (*Saxifraga virginiensis*) and swamp saxifrage (*Saxifraga pennsylvanica*) in wet ground. *Saxifraga sarmentosa*, a well-known Chinese species, is generally grown as a hanging-basket plant. The cultivated varieties grow well on ordinary good soil. They are propagated by division or cutting in the spring or by seeds sown as soon as they are ripe in cold frames. Most species prefer higher ground. See Plates of Spiræa, etc.; Mountain Plants.

TUFTED SAXIFRAGE (*Saxifraga cæspitosa*).

SAXIFRAGINE, săk-sĭf'rà-jĭn. See Explosives.

SAXO GRAMMATICUS (Lat., Saxo the grammarian) (c.1150–c.1220). The most celebrated of the early Danish chroniclers. He was secretary to Archbishop Absalon (q.v.) and is said to have died at Roskilde. His work is called *Gesta Danorum*, or *Historia Danica*, giving the history of Denmark from Dan to 1185, and consists of 16 books. The earlier portions are not critical, but in regard to times near his own Saxo Grammaticus is an invaluable authority. According to his own statement he derived his knowledge of the remoter period of Danish history from old songs, runic inscriptions, and the historical notices and traditions of the Icelanders. A characteristic feature of the work is the large number of translations of early verses, most of which are preserved only in this form. As a source of history it ranks high in European literature. The best edition of the *Historia Danica* is that undertaken by P. E. Müller and finished by J. M. Velschov (Copenhagen, 1839–58; ed. by Holder, Strassburg, 1886). The first nine books, dealing with the heathen age, have been translated into English by O. Elton, with explanatory notes by F. York Powell (in the *Norræna Series*, London, New York, etc., 1906). Danish translations by A. S. Vedel (1575), N. F. S. Grundtvig (1818–22), F. Winkel Horn (1898), J. Olrik (1908–12). For Saxo's treatment of the Hamlet story, see Amleth.

SAXON, Low. See Plattdeutsch.

SAXON ART. See Anglo-Saxon Art.

SAX'ONLAND. The section of Transylvania (q.v.) to which large numbers of Germans migrated in the Middle Ages and where their descendants still live.

SAX'ONS (Lat. *Saxones;* connected with OHG. *sahs*, AS. *seax*, archaic Eng. *sax*, knife, sword, Lat. *saxum*, rock, stone). A Germanic people who first appear in history after the beginning of the Christian era.

The earliest mention of the Saxons is by Ptolemy in the second century A.D., at which time they appear to have dwelt in what is now Schleswig. In the third and fourth centuries they pressed southward into the region of the Weser, where they encountered the Chauci and Angrivarii, who were subdued and absorbed. In the second half of the fourth century we find them breaking into the Roman dominions. By the close of the sixth century all northwest Germany as far east as the Elbe had come to be the land of the Saxons. They invaded Britain perhaps as early as the third century; in the fifth century they occupied the coasts of Normandy. In the fifth and sixth centuries a part of the Saxons passed over into Britain, where the Jutes had already established themselves and where they were joined by the Angles. At the beginning of the seventh century the Anglo-Saxon conquest of Britain was in a great measure completed. Pepin, King of the Franks, attacked the Saxons in Germany (the Old Saxons) successfully, and Charles the Great subdued them after fierce wars (772–804) and forced their chiefs to accept Christianity. (See Charles the Great.) In the course of the ninth century, when under the descendants of Charles the Great a strong central power had ceased to exist in Germany, a great national Saxon duchy rose into existence. This old Duchy of Saxony was dissolved towards the close of the twelfth century, and the name of Saxony passed over to an entirely different region from that which had been the home of the Saxons. Consult A. F. Schaumann, *Geschichte des Niedersächsichen Volkes* (Göttingen, 1839), and Gustav Hey, *Die slawischen Siedelungen im Königreich Sachsen* (Dresden, 1893). See Saxony.

SAXON SWITZERLAND. A mountainous district in the eastern part of Saxony (q.v.).

SAX'ONY. A kingdom and a state of the German Empire (Map: Germany, E 3). Its present limits were defined in 1815. Area, 5789 square miles. It is the fifth German state in size and the third in population.

Saxony is a country of moderate elevations. The Erzgebirge, on the Bohemian frontier, slope very gradually in the form of a plateau across the Kingdom and are flanked by the Elster Mountains at the southern apex of the country and the granite Lusatian group at the extreme eastern corner. On the northwest the slope is to the plain of Leipzig from a second and parallel range extending from the southwest to the vicinity of Döbeln in the northeast. The highest peak of Saxony is in the Erzgebirge—Keilberg (4052 feet) of the Fichtelberg Range, rising south of Chemnitz. Over half of the total area of Saxony is arable. The Elbe River enters near the eastern end of the Erzgebirge, and here is found the famous district known as Saxon Switzerland. The low but picturesque heights of the Elbsandstein (sandstone) Mountains, with their wonderful castellated rock formations, its forests of pine, and the narrow curving river valley form a region of great beauty. The Elbe, the only great commercial waterway of Saxony, traverses the Kingdom in a northwestern direction. The Mulde flows north through the north-

western part. There are no lakes. The climate is, on the whole, moderate, agreeable, and favorable to agriculture. The rainfall is abundant, about 30 inches per year, and falls principally in the summer months.

Saxony has long been celebrated for its rich silver mines at Freiberg. They were discovered in the twelfth century. Coal, mostly lignite, is abundant in the Plauenregion. Iron, lead, and tin, besides other minerals, as well as marble and precious stones, are mined. There are numerous mineral-spring resorts, Bad-Elster being the best known. About one-fourth of Saxony is covered with forests, nearly half of the forest area being owned by the state. About 85 per cent of the trees are conifers. The annual income from the forest lands is large. Of the population approximately one-fifth are engaged in agriculture and stock raising. Of the total area in 1900, 843,800 hectares were in cultivated field and garden; 175,400 hectares, meadow; 8500 hectares, pasture; 384,500 hectares, forest; 77,100 hectares, roads, yards, water, etc. The areas devoted to leading crops and the production in metric tons in 1913 in hectares were:

CROPS	Hectares	Tons
Rye	210,193	490,315
Wheat	67,119	192,138
Summer barley	22,352	57,100
Oats	194,324	487,980
Hay	174,004	840,656
Potatoes	127,857	1,946,359

Sheep raising has greatly declined, but horse breeding is still important. Live stock, Dec. 1, 1913: horses, 176,000; cattle, 714,000; sheep, 58,000; goats, 136,000; swine, 2,102,000.

Saxony has long been a famous manufacturing country. In 1912 there were 33,555 manufacturing establishments, with 806,408 employees, of whom 69,846 were under 16 years of age. The most extensive and highly developed branch of manufacturing is the textile industry. Linens, cottons, woolens, silks, worsteds, muslins, hosiery, laces, embroideries, damask, ticking, clothing, furniture, paper of all kinds, smoking pipes, watches, cutlery, glass, steam machinery, and pianos may be mentioned among the prominent manufactures. The celebrated Meissen or Saxony porcelain (Dresden china) is produced at the state porcelain factory at Meissen. Saxony makes famous glassware and originated the art of tin plating. The printing of books and maps is carried on on a vast scale, and the book trade of Leipzig leads the world. The serpentine-stone industry employs many hands. The sugar manufactories (the first dating from 1883) have increased greatly in importance. The chocolate shipments are large. Milling and smelting are important industries. Since the Middle Ages, when the great fairs of Leipzig were founded and it shared in the immense trade from the Levant, Saxony has been important in the commerce of mid-Europe. It is the centre of the transit trade of mid-Germany. Saxony is a heavy shipper to the United States, especially in textiles, leather goods, and musical instruments. The Elbe and other streams are canalized and transport an enormous amount of freight. All the classes of institutions for furthering and protecting the industrial interests are adequately developed and represent a highly complicated and effective system of industrialism and finance.

In 1912 broad-gauge railway in operation totaled 1656.7 miles (of which 12.6 miles private); narrow-gauge, 315.5 miles (all state); total, 1972.2 miles.

The government is a constitutional hereditary monarchy, under the constitution of 1831, which has frequently been modified. The Ministry of State, which shares the executive power with the King, is composed of six ministers representing Finance, War, Interior, Justice, Foreign Affairs, and Worship and Public Instruction. There are two legislative Chambers. The first corresponds to a senate and is composed of princes and persons occupying high positions both religious and secular; the total number of members is 48. Its President is named by the King. The Lower House consists of 91 members (43 from the towns and 48 from the rural communes), elected in accordance with a suffrage system that is based on property or educational qualifications and the principle of plural voting. Dresden is the capital. Saxony has four votes in the Bundesrat and sends 23 members to the Reichstag.

The budget for one year of the financial period 1914 and 1915 balanced at 492,485,443 marks. The estimated receipts and expenses of the state railways were 214,506,000 and 204,666,544 marks respectively. Next to railways the largest source of income is direct taxes (87,029,600 marks). The civil list is 3,778,877 marks. The public debt, Jan. 1, 1914, stood at 873,172,600 marks. State property at the end of 1911 was valued at 1,935,407,790 marks, of which railways 1,161,870,651 marks.

The population of Saxony in 1816 was 1,194,000; 1864, 2,337,000; 1880, 2,972,805; 1900, 4,202,216; 1910, 4,806,661. Density per square kilometer, 1871, 170.5; 1910, 320.6. In 1910 Evangelicals numbered 4,520,835 (94.05 per cent); Roman Catholics, 236,052 (4.91). The religion of the court is Roman Catholic. Population of the larger cities according to the 1910 census: Leipzig, 589,850; Dresden, 551,697; Chemnitz, 293,761; Plauen, 121,272; Zwickau, 73,542; Meissen, 39,797; Zittau, 37,084; Freiberg, 36,237; Bautzen, 32,975.

The educational system is highly developed. The university at Leipzig stands at its head. In Dresden is the royal technical high school, and at Freiberg is the most famous mining academy in the world. Leipzig has a celebrated royal conservatory of music, and Dresden has also a royal music school. Saxony is famous for its art collections, libraries, museums, and the Dresden Opera, for more particular mention of all of which see DRESDEN; LEIPZIG.

History. Saxony was the name originally given to the country which was the home of the great Lower German stock (see SAXONS), extending from the Eider River and the Zuyder Zee to where Cassel and Magdeburg are now.

Charles the Great, King of the Franks, began the conquest of the Saxons in 772. Their great leader Widukind (Wittekind) submitted and accepted baptism in 785, but their subjugation was not complete until 804. By forcing a large number of Saxons to settle in different parts of his dominions and by colonizing their territories with Frank settlers, Charles the Great succeeded in incorporating them into his own Empire. A number of bishoprics were erected by Charles and his immediate successors in the Saxon land, which was soon Christianized. By the Treaty of Verdun (843) the country was given to Louis

the German. The people were so harassed by Slavs and Northmen that powerful marks (see MARK) were created for the purpose of protection. Liudolf was appointed first Duke (Herzog) of a mark on the west side of the Elbe, and he and his descendants gradually extended their power over the whole of Saxony. This was the original of the old national Saxon Duchy. Liudolf was succeeded by his son Bruno, who was followed by Otto the Illustrious (died 912), who added Thuringia to the duchy. His son Henry, surnamed the Fowler (912–936), was elected King of Germany in 919, founding a dynasty which ruled Germany until its extinction in 1024.

Henry the Fowler created the Schleswig Mark, to protect the country from the Danes. He also conquered the tribes between the Elbe and the Oder, creating the East Mark, which he protected by strongly fortified castles and border towns. Furthermore, the country which later became the powerful Mark of Brandenburg under Albert the Bear was conquered. Henry was succeeded by his son Otho I the Great, whose coronation by the Pope at Rome in 962 inaugurated the Holy Roman Empire of the German Nation. Otho had to wage continuous war against his rebellious nobles, and to gain support gave the Duchy of Saxony in 960 to his loyal follower, Hermann Billung. When the duchy lapsed with the death of Magnus, the last of the Billungs, in 1106, Henry V gave the duchy to Lothair, Count of Supplinburg, one of the most powerful German princes, who ascended the Imperial throne in 1125 with the aid of the papal party. In 1127 he gave the Duchy of Saxony to his son-in-law, Henry the Proud, Duke of Bavaria, of the house of Guelph, who also inherited extensive private possessions in Saxony through his mother, a member of the Billung family. The Emperor Conrad III, of the house of Hohenstaufen, would not allow Henry to have the two duchies and bestowed the Saxon Duchy on Albert the Bear, who in 1134 had received the North Mark. During the strife which ensued Henry died. In the meantime the Saxons had revolted against Albert. After Henry's death the Emperor took away the duchy from Albert, bestowing it in 1142 on Henry the Lion (q.v.), the young son of Henry the Proud. Albert was allowed to rule the Mark of Brandenburg, which was composed of the North Mark and a part of the East Mark, as an independent state.

Henry the Lion at this time had almost royal possessions. But his insolent and defiant attitude towards the Emperor Frederick Barbarossa brought about his downfall (1180–81) and the dissolution of the old Saxon Duchy. To Bernhard of Ascania, son of Albert the Bear, were given the title of Duke of Saxony and a small district between the Elbe and the Weser, while the rest of the great duchy was divided among powerful bishops and princes. Henry was allowed to keep only Brunswick and Lüneburg. Anhalt and Wittenberg also belonged to Bernhard, and when his two grandsons, John II and Albert, divided their possessions in 1260, they created two small duchies of Saxe-Lauenburg and Saxe-Wittenberg. The capital of the latter, Wittenberg, was entirely outside of the old duchy. Both duchies claimed the electoral privilege, including the office of grand marshal; but in 1356 the Golden Bull confirmed the claims of Wittenberg. The Ascanian line became extinct in 1422 with Albert III. In 1423 the Emperor Sigismund conferred the Duchy of Saxe-Wittenberg, together with the electoral dignity, on Frederick the Warlike, Margrave of Meissen, of the house of Wettin, in consideration of aid received in wars waged against the Hussites. The name of Saxony was gradually extended to the Mark of Meissen and the other old possessions of the house of Wettin and thus came to denote a very different region from the old Saxon Duchy.

Frederick the Warlike was descended from Henry of Eilenburg, who had received the Mark of Meissen in 1089. In 1123 Meissen passed to Conrad of Wettin. He divided the lands among his sons, and their descendants followed the same policy. Under Margrave Otho the Rich (1156–90) the Leipzig fairs were established. One of his descendants, Henry the Illustrious (1221–88), inherited Thuringia. In the fourteenth century the Pleissnerland (including Altenburg, Zwickau, and Chemnitz) became a possession of Meissen. In 1381 Frederick the Warlike became Margrave. His successor was his son, Frederick II the Gentle (1428–64), who gained some territory, but in 1445 began a destructive civil war between Frederick and his brother William for the possession of Thuringia. It was ended in 1451.

Frederick II was succeeded by his two sons, Ernst (1464–86) and Albert (1464–1500), who, in accordance with the will of their father, reigned conjointly over the hereditary domains of the family; but in 1485 the territories were divided, most of Thuringia, the Electoral Duchy of Saxony, and other territories, with the electoral dignity, going to the Ernestine or elder line, which still rules in the Saxon duchies, and Meissen and other territories (including the city of Leipzig) to the Albertine line, which survives in the Kingdom of Saxony. Wittenberg was the capital of the electoral line, while Dresden became the capital of the Albertine or ducal line. Ernst was succeeded by his son, Frederick the Wise (1486–1525), the friend and protector of Martin Luther and one of the most influential of the German princes. His brother and successor, John the Constant (1525–32), was still more a partisan of the reformed doctrines, as was also John's son and successor, John Frederick the Magnanimous (1532–47). The latter and Philip, Landgrave of Hesse, were at the head of the League of Schmalkald in the disastrous war waged against the Emperor Charles V (1546–47). Through the defeat at Mühlberg (q.v.) John Frederick lost his electoral dignity and the bulk of his dominions, which were transferred to the Albertine line. The Thuringian territories alone were left to the Ernestine princes. See SAXE-WEIMAR; SAXE-COBURG-GOTHA; ETC.

Albert, the founder of the younger ducal or Albertine line, was succeeded by his sons, George the Bearded (1500–39) and Henry the Pious (1539–41), a zealous Protestant, after whom came the celebrated Maurice (1541–53), who, though a Protestant, gave his aid to the Emperor against the League of Schmalkald and was rewarded with the electoral title and the greater portion of the estates of his vanquished cousin. He afterward turned against the Emperor and secured the triumph of Lutheranism in Germany. Maurice's brother Augustus (1553–86) established numerous excellent institutions and considerably increased his territories by purchase and otherwise. Christian I (1586–91), a weak prince, surrendered the reins of government to

his chancellor, Crell, who was sacrificed, in the succeeding reign of Christian II (1591–1611), to the vengeance of the offended nobility. John George I (1611–56) fought on the side of Austria at the beginning of the Thirty Years' War (q.v.), was afterward forced into a half-hearted alliance with Gustavus Adolphus (1631), and in 1635 concluded a separate peace with Austria by which he obtained Upper and Lower Lusatia.

From the time of the Thirty Years' War Saxony ceased to be the leading Protestant state in Germany, its power being overshadowed by that of Brandenburg. The reign of Frederick Augustus I, known as Augustus the Strong (1694–1733), almost ruined the hitherto prosperous electorate. (See AUGUSTUS I.) Frederick Augustus was chosen King of Poland in 1697, embracing Catholicism, which remained the religion of his successors. His attempt with Peter the Great and the King of Denmark to dismember Sweden brought down upon him and his two states the vengeance of Charles XII (q.v.). Poland was devastated and Saxony exhausted of money and troops. The King's habits were most extravagant, and to maintain his lavish magnificence he sold important portions of territory. Frederick Augustus II (1733–63) contended with Stanislas Leszczynski (q.v.) for the Polish throne, being recognized as King in 1735. He plunged Saxony into the War of the Austrian Succession (see SUCCESSION WARS) and into the Seven Years' War (q.v.), and a long time elapsed before it recovered prosperity. (See AUGUSTUS II; BRÜHL.) Frederick Augustus (1763–1827) joined Prussia against Napoleon in 1806, his army participating in the disastrous battle of Jena. The pressure of the French compelled him to join the Confederation of the Rhine in 1806; at the same time he assumed the kingly title as Frederick Augustus I (q.v.). He became the ally of Napoleon, who, after the Peace of Tilsit in 1807, conferred upon him the newly created Duchy of Warsaw (see POLAND); and the Saxon troops fought at Wagram, in Russia, and at Leipzig. After the overthrow of Napoleon at Leipzig (October, 1813) he was for a time a prisoner in the hands of the allies, and the Congress of Vienna (1814–15) deprived him of more than half of Saxony, which was handed over to Prussia, although he was allowed to retain the title of King. He did much for the internal welfare of his country.

Anthony (1827–36) reformed the entire legislative system of the Kingdom and granted a liberal constitution, being urged thereto by a popular outbreak in the autumn of 1831. His nephew, Frederick Augustus II (1836–54), who had been Regent for several years, succeeded, but, though he was favorable to constitutionalism, the new system did not work well. In 1849 there was an insurrection in Dresden, which was suppressed by Prussian arms. Towards the close of the King's reign he was a mere tool in the hands of the reactionary party, headed by his brother John, who succeeded him in 1854. John's policy was guided by Count Beust (q.v.), Prussia's inveterate enemy, and Saxony was kept in line against Bismarck's policy. She joined Austria in the Seven Weeks' War (q.v.), shared in the defeat of Sadowa, and was compelled to join the North German Confederation (1866). In 1871 Saxony became a member of the new German Empire. John was succeeded by his son Albert in 1873, who was very conspicuous in the Franco-Prussian War. He was succeeded by his brother George in 1902. George died in 1904 and was succeeded by his son Frederick Augustus III.

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SAXONY. A province of Prussia (Map: Germany, E 3). It is broken up by numerous enclaves and covers an area of 9756 square miles. The surface is level in the north, while the western and southern parts belong to the region of the Harz Mountains and the Thuringian Forest. It is watered chiefly by the Elbe with its tributary the Saale and several tributaries of the Weser, most of them navigable. Saxony is one of the most fertile and agriculturally the best developed parts of the German Empire. Its chief crops are rye, wheat, oats, barley, potatoes, and sugar beets. Tobacco and the vine are also cultivated to some extent. Gardening is carried on extensively, and the yield of fruit is very considerable. The raising of domestic animals is also very important. There are rich deposits of lignite and rock salt, and iron, copper, silver, and nickel are found. There are manufactures of metal ware, arms, machines, tools, etc. Chemical works, woolen and linen mills, tanneries, paper and sugar mills, shoe factories, and distilleries are prominent. The centres of commercial activity are Magdeburg and Halle. The province is divided into the three government districts of Magdeburg, Merseburg, and Erfurt. In the Prussian Landtag it is represented by 38 delegates in the Lower and 30 members in the Upper Chamber, while to the German Reichstag it returns 20 members. Capital, Magdeburg. Pop., 1816, 1,197,000; 1890, 2,580,010; 1900, 2,832,616; 1910, 3,089,275, chiefly Protestants. The province was formed in 1815.

SAXONY, BERNHARD, DUKE OF. See BERNHARD, COUNT OF ANHALT.

SAXONY, GRAND DUCHY OF. See SAXE-WEIMAR.

SAXONY, JORDAN OF. See JORDANUS, NEMORARIUS.

SAX'OPHONE (from *Sax* + Gk. *φωνή, phōnē*, sound, voice). A musical instrument invented about 1840 by Adolphe Sax. It consists of a conical brass tube, having about 20 lateral orifices covered by keys, and it is played by means of a mouthpiece and a simple reed, like the clarinet. The compass of the various instruments of this family extends over five octaves from $_1A$ to a^3. The music for all, even the lower saxophones, is written in the treble clef.

SAX'TON, JOSEPH (1799–1873). An American inventor, born at Huntingdon, Pa. He went to Philadelphia in 1817 and while there invented a machine for cutting the teeth of chronometer wheels, and an escapement and compensating pendulum for clocks, and constructed a clock for the steeple of Independence Hall. He went to

London in 1828 and resided there nine years, enjoying the acquaintance of Faraday. On his return to Philadelphia he superintended the making of machinery for the United States Mint and afterward had charge of the construction of standard weights and measures, accurate sets of which were furnished to national and State governments. Among his ingenious contrivances may be mentioned a mirror comparator for comparing standards of length and a new form of dividing engine; a deep-sea thermometer, used by the United States Coast Survey in exploring the Gulf Stream; a self-registering tide gauge, and an immersed hydrometer.

SAY, sā, JEAN BAPTISTE (1767–1832). An eminent French economist, born at Lyons. In 1790 he took up the profession of journalism and in 1794 became editor of the *Décade Philosophique Littéraire et Politique*. In 1799 he was called to the tribunate by Napoleon and was assigned to the Committee of Finance. In 1803 he published the first edition of his *Traité d'économie politique*. Its views on finance displeased Napoleon, and his retirement to private life followed. In 1819 he became professor of industrial economy at the Conservatoire des Arts et Métiers, and in 1830 professor of political economy at the Collège de France. Say made some important contributions to economic theory. In his advocacy of free trade he went beyond Adam Smith, but cannot be classed with Smith as an original thinker.

SAY, LÉON (1826–96). A French economist. He was a grandson of Jean Baptiste Say and came into prominence through his connection with the *Journal des Débats*, exercising a great influence on the financial administration of the country. Elected deputy in 1871, Say was made Prefect of the Department of the Seine and the next year Minister of Finance. This portfolio he held six times thereafter. He presided over the international monetary conference at Paris in 1879 and was sent to London in 1880 as Ambassador to negotiate a treaty of commerce, but failed. Afterward he was elected President of the Senate. A large part of the remainder of his life was spent in one House or the other of the French Legislature. Say was a prolific writer on financial subjects. A comprehensive *Dictionnaire des finances*, a standard authority upon French financial practice and history, was published under his supervision. His work, *Les finances de la France* (1883), in four volumes, gathers together his various expositions of financial questions. He wrote also: *Histoire de la caisse d'escompte* (1848); *Rapport sur le payement de l'indemnité de guerre* (1874); *Les solutions démocratiques de la question d'impôts* (1886); *Turgot* (1887); *David Hume* (1888); *Cobden* (1891); *etc.*

SAY, THOMAS (1787–1834). An American geologist and zoölogist, born in Philadelphia. Becoming a member of the Academy of Natural Sciences in Philadelphia (1812) soon after its founding, he devoted much time and labor to developing its collections. In 1818 he took part in a scientific exploration of Georgia and Florida, and in 1819–20 he was naturalist to Major S. H. Long's expedition to the Rocky Mountains. Say was a collector of insects and mollusks, and his works describing them were the beginnings of the sciences of entomology and conchology in America. His larger works were *American Entomology* (1824–28; reprinted and edited by J. L. Le Conte, 1859) and *American Conchology* (1830–34; new ed. by W. G. Binney, 1858). He became interested in, and after 1825 was a member of, the Socialistic community at New Harmony, Ind., where he died.

SA'YAN. See CHAY ROOT.

SAYANA, sä'yä-nä (?–1387). A Sanskrit commentator, who flourished at the courts of Bukka I (1350–79) and Harihara II (1379–99), kings of Vijayanagara, the modern Hampi on the Tungabhadra, in the Bellary district of Madras. By far the most important work of Sayana was his commentary on the Rig-Veda. Internal evidence shows that this was only partly his and that his incompleted work was finished by the school of commentators which he founded. The varying estimates given to this gloss have formed one of the hardest problems of Vedic interpretation. (See VEDA.) The traditional school accepted Sayana as its guide. Herein the traditionalists were in sharp conflict with the linguistic or philological school. This commentary has been edited by Max Müller in his *Rig-Veda-Samhita* (2d ed., 4 vols., Oxford, 1890–92) and edited and translated by Dutt (13 vols., Calcutta, 1906–12). Besides this there is a long list of works attributed either to Sayana or to his brother Madhava, who was also called Vidyaranya. Among Sayana's numerous works that have been published are his commentaries on the following: *Atharva* by Pandit (Bombay, 1895); *Aitarēya Aranyaka* by Agase (Poona, 1896); *Sāma Vēda* by Samasrami (Calcutta, 1874–76); *Tandya Mahābrāhmana* by Vedantavagisa (ib., 1869–74); *Vamśabrāhmana* by Burnell (Mangalore, 1873); *Tāittirīya Aranyaka* and *Tāittirīya Brāhmana*, by Apte (Poona, 1897–98); *Catapatha Brāhmana* of the *White Yajurveda* by Samasrami (9 vols., Calcutta, 1903–12). Other works by Sayana that have been recently edited are *Panchadasi* by Bharatitirtha (1899) and by Pansikar (Bombay, 1905), and *Sarva-darśana-samgraha, or Review of the Different Systems of Hindu Philosophy*, translated by Cowell and Gough (2d ed., London, 1894) and edited by Goswani (Benares, 1903). A list of the works attributed to him is given by Aufrecht, *Catalogus Catalogorum* (Leipzig, 1891–1903).

SAY'BROOK. A town in Middlesex Co., Conn., 19 miles west by south of New London, on the New York, New Haven, and Hartford Railroad (Map: Connecticut, F 4). Pop., 1910, 1907. In 1635 a small fort was built in what is now Old Saybrook. In 1639 George Fenwick settled here and named the place in honor of Lord Say and Sele and Lord Brooke, of the colonizing company. For six years Saybrook was an independent colony, but in 1644 Fenwick ceded the settlement and the land in its vicinity to the Connecticut Colony. Saybrook was the early home of Yale College, which remained here until removed to New Haven in 1716. In 1708 the celebrated Saybrook Platform, for Church government, was adopted here. Saybrook formerly included the towns of Old Saybrook, Westbrook, Essex, Chester, and part of Lyme.

SAYBROOK PLATFORM. A name given to certain articles adopted by a synod consisting of 12 ministers and four laymen, representing the churches of Connecticut, which met at Saybrook, Sept. 9, 1708, to take measures to increase the religious efficiency of the churches. The articles provided that the churches of the Colony should be grouped in standing councils. Ministers were grouped in associations, and an

annual "general association" was provided. The articles were approved by the Legislature and carried into effect in 1709. They remained the legally recognized standard till 1784. Consult Williston Walker, *Creeds and Platforms of Congregationalism* (New York, 1893).

SAYCE, sās, ARCHIBALD HENRY (1846–). An English Orientalist. He was born at Shirehampton and graduated at Queen's College, Oxford, where he became fellow in 1869. From 1874 to 1884 he was a member of the Old Testament Company of the Bible Revision Committee. From 1876 to 1890 he was deputy professor of comparative philology at Oxford and became professor of Assyriology in 1891. His scholarly activity covers a large range of subjects—Assyriology, Oriental history, biblical criticism, the Hittites, comparative philology, and general archæology. Among his works are: *An Assyrian Grammar for Comparative Purposes* (1872); *The Principles of Comparative Philology* (1874); *Introduction to the Science of Language* (1879; 4th ed., 1900); *The Monuments of the Hittites* (1881); *The Ancient Empires of the East* (1884); *Assyria* (1885); *Babylonian Religion* (1887), Hibbert Lectures; *The Races of the Old Testament* (1891); *The Higher Criticism and the Verdict of the Monuments* (1894); *Patriarchal Palestine* (1895); *Babylonians and Assyrians* (1900); *The Archæology of Cuneiform Inscriptions* (1907). He also edited the *Records of the Past* (2d series, 1888–92), etc.

SAYRE, sār. A borough in Bradford Co., Pa., 59 miles northwest of Scranton, on the Susquehanna River and at the terminus of a division of the Lehigh Valley Railroad (Map: Pennsylvania, J 2). It has the R. A. Packer Hospital, the People's Hospital, and fine town-hall and Elks Home buildings. There are extensive shops of the Lehigh Valley Railroad, wheel and foundry works, metal works, a foundry, and manufactories of various iron products. Pop., 1900, 5243; 1910, 6426.

SAYRE, LEWIS ALBERT (1820–1900). An American surgeon, born at Bottle Hill (now Madison), N. J. He received his medical education from Dr. David Green and at the College of Physicians and Surgeons, New York (M.D., 1842), where he served as prosector in surgery for 10 years. In 1862 he was appointed professor of orthopedic surgery at Bellevue Hospital Medical College, the first in the United States to hold such a post. In 1880 he served as president of the American Medical Association. Sayre was one of the first to advocate the opening by incision of all suppurating joints. In 1854 he performed resection of the hip for ankylosis. Sayre invented several surgical instruments—a flexible probe, a uvulatome, an improved tracheotomy tube, etc. Among his works are: *Practical Manual on the Treatment of Club Foot* (1869; 4th ed., 1894); *Lectures on Orthopedic Surgery and Diseases of the Joints* (1876; 2d ed., 1883), translated into German (1886) and French (1887); *Spinal Disease and Spinal Curvature* (1877), advocating the use of the plaster of Paris jacket for the treatment of spinal diseases and curvatures. As officer of the board of health of New York City he prepared several important reports.

SAYRE, STEPHEN (1734–1818). An American patriot, born at Southampton, Long Island. He was educated at the College of New Jersey (now Princeton University) and after engaging in various pursuits went to London, where in 1774, during the excitement over John Wilkes (q.v.), he was elected one of the two city sheriffs. Soon afterward, having become known as an advocate of American independence, he was committed to the Tower on a charge of plotting to overturn the government, but five days later the charge was dismissed, and he was freed on a writ of habeas corpus and won his suit for false imprisonment. During the Revolutionary War he made himself conspicuous in the capitals of northern Europe by his activity in behalf of the United States. His motive was patriotic, but his efforts were not authorized by the American government except when he was secretary to Arthur Lee (q.v.) in Berlin, and when in 1780 he went to St. Petersburg in behalf of the scheme of armed neutrality. His claims for remuneration for his services were repeatedly refused by Congress until 1807, when it allowed him a certain sum for his services in Berlin. In 1795 he became an opponent of Washington's administration and was especially vehement in attacking the Jay Treaty.

SCABBARD FISH. See CUTLASS FISH; FROSTFISH.

SCABIES, skā′bī-ēz. See ITCH; MANGE.

SCA′BIOUS (OF., Fr. *scabieuse*, from ML. *scabiosa*, fem. sing. of Lat. *scabiosus*, rough, scaly, from *scabies*, scurf, scab; so called because regarded as a remedy for skin diseases), *Scabiosa*, or *Succisa*. A genus of herbs of the family Dipsacaceæ, natives of the Eastern Hemisphere. The flowers are collected in terminal heads, surrounded by a many-leaved involucre,

SCABIOUS (*Scabiosa succisa*).

which resembles the head of a species of Compositæ. The devil's-bit scabious (*Scabiosa succisa*, or *Succisa pratensis*), common in European pastures, is astringent and was formerly in medicinal repute in skin eruptions. The root is very abruptly pointed, on which account Middle Age superstition regarded it as bitten off by the devil, out of envy because of its usefulness to mankind. A number of varieties are in common cultivation as ornamentals. This species and a taller one, *Succisa australis*, are sparingly natu-

ralized in New England and elsewhere. *Erigeron annuus* is sometimes called sweet scabious.

SCAD (probably a variant of *shad;* less plausibly explained as from Ir., Gael. *sgadan,* herring). Any of several fishes of the family Carangidæ, or horse mackerels; especially a small species (*Trachurus trachurus*), rare in America, but numerous and valuable on the southern coast of Europe. It is a foot long and greenish, with silvery sides and a dusky opercular spot. (See Plate of Horse Mackerels, etc.) The name is also applied to species of other genera of the family, especially to a small similar fish, the mackerel scad (*Decapterus punctatus*), common along the eastern American coast and especially about the West Indies, where also is a second species. Other names for them are antonino, cigar fish, round robin, and quia-quia.

SCÆVOLA, sĕv'ô-lȧ, Gaius Mucius. See Porsena.

SCAFFOLDING. See Staging.

SCALA, skä'lȧ, Della. The name of an Italian family whose seat was Verona, of which place the Ghibelline Mastino della Scala was elected podesta in 1260. He became perpetual captain of the city and Imperial vicar, and was assassinated in 1277. His successors, Alberto (died 1301), Bartholomew (died 1304), and Alboino (died 1311), extended the influence of the family. The greatest of the family was Can Francesco, or Can Grande, as he was called (1291–1329), who filled his court with sculptors and poets, preëminent among whom stands Dante, who eulogizes his patron in glowing terms in the *Paradiso.* He was a friend of Henry of Luxemburg, who appointed him Imperial vicar and head of the Ghibelline League of Lombardy. He carried on a bitter warfare with Padua and extended his power over Este, Cremona, Monselice, Feltre, Vicenza, and Treviso. Under Mastino II (died 1351) the family declined in influence, and in 1387 Verona came under the dominion of the Visconti.

SCALA, La (It., the staircase). A famous theatre in Milan, Italy, built in 1778, next in size to the San Carlo Theatre at Naples, and holding 3600 spectators.

SCALA SANTA, sän'tȧ. See Lateran, Church and Palace.

SCAL'AWAGS. See Party Names.

SCALCHI, skäl'kê, Sofia (1850–). An Italian operatic singer, born in Turin. She made her début in Mantua in 1866 and sang in opera throughout Europe. In 1883 she made her first appearance in the United States, where she became a great favorite. Her voice, a rich contralto of extensive compass, enabled her also to sing mezzo-soprano.

SCALD. See Skald.

SCALDS. See Burns and Scalds.

SCALE (Lat. *scala,* staircase, ladder, from *scandere,* to climb, Skt. *skand,* to spring, ascend). In music, a succession of notes arranged in the order of pitch and comprising those sounds which may occur in a piece of music written in a given key. The scale consists of a series of seven steps leading from a given note (fixed on as the tonic or keynote) to its octave, which may be extended indefinitely up or down, so long as the sounds continue to be musical. For an explanation of the principles on which these scales are founded and of their derivation from the harmonic triad, see Major; Minor. See also Chromatic; Greek Music; Modes; Pentatonic Scale.

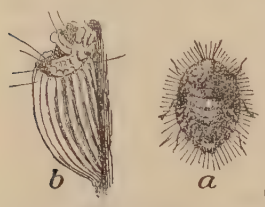
SCALE INSECT (AS. *scealn, sceale,* OHG. *scala,* Ger. *Schale,* shell, husk, scale, Goth. *skalja,* tile; probably connected ultimately with Eng. *shell*). Any insect of the family Coccidæ (q.v.), sometimes also called scale bug, or bark louse. The scale insects are distinguished from their nearest allies by the absence of wings in the females, by the possession of only two wings in the males, by the absence of any mouth or feeding apparatus in the adult males, which, instead, are usually supplied with large supplementary eyes. Further, in both sexes the legs (when present) terminate in a single claw at the tip of a single-jointed tarsus. The group is now divided into 12 subfamilies, which are distinguished as follows: the true scale bearers belong to the subfamilies Conchaspinæ and Diaspinæ, the scale in the former group being composed of secreted matter, in the latter cast skins and secreted matter together. The so-called "naked" scales compose the 10 other subfamilies, nearly all the species of which secrete some substance which more or less disguises them. The subfamilies are more or less characterized as follows: Dactylopiinæ (mealy bugs, q.v.), covered with a white, waxy, powdery secretion which sometimes forms long, apparently fibrous bundles; Lecaniinæ proper, a cleft posterior extremity in the female; Hemicoccinæ, larvæ with abdominal lobes. Tachardiinæ, lac insects (see Lac), inclosed in a resinous cell with three orifices; Coccinæ, no anal tubercles in the female; Idiococcinæ, short antennæ; Brachyscelinæ, gall-making coccids. In each of these subfamilies the males have simple eyes; in the Ortheziinæ and Monophlebinæ they have compound eyes. The last-named group, mainly Australian, contains the largest species, some of which are more than an inch long.

The scale insects live upon the sap of plants and with few exceptions are considered pests. (See San José Scale; Oyster-Shell Bark Louse; Orange Insects.) Since they are insignificant in appearance and are attached to all parts of the plant, some of them have spread upon nursery stock and fruit and have become cosmopolitan in their distribution. With many the original home is a matter of doubt.

Among the most notable American scale insects are the following: cottony cushion scale (*Icerya purchasi*), once troublesome in California, but subdued by a ladybird (*Novius cardinalis*) imported from Australia (see Ladybird); species of the genus *Kermes,* remarkable for the gall-like form of the adult females, which closely resemble small oak galls; cottony maple scale (*Pulvinaria innumerabilis*), a brown naked scale which secretes a large, white, waxy, unribbed egg mass; black scale of the orange and olive (*Lecanium oleæ*), a cosmopolitan species, troublesome in California; hemispherical scale (*Lecanium hemisphæricum*), a common greenhouse pest throughout the world, living out of doors upon citrus trees in the Gulf States. Of the true armored scales, aside from those mentioned, there are the scurfy bark louse of the apple (*Chionaspis furfurus*); pine-leaf scale (*Chionaspis pinifoliæ*); and the common rose scale (*Diaspis rosæ*), all of which are often troublesome upon their host plants. Most scale insects are oviparous. Certain species, however, are viviparous, and some must be parthenogenetic. With one species, the common "flat" scale (*Lecanium hesperidum*), which is

cosmopolitan and a frequent denizen of hothouses, the male has never been found, although the females occur in incalculable numbers.

Remedies for Scale Insects. In temperate regions, with those species which hibernate in the egg stage, scale insects can usually be controlled by spraying the plants with kerosene emulsion in the early spring as soon as the young have hatched, the young insects being unprotected by a scaly covering. With species which hibernate in the adult or half-grown condition protected by the scale, and which give birth to young at irregular and prolonged periods, pure kerosene and crude petroleum may be lightly sprayed upon dormant fruit trees, generally in the bright sunlight, when evaporation will be so speedy that the trees will remain uninjured. Many treatments of this kind have been successful, but others have resulted in the loss of valuable trees. Petroleum and water mixed by specially devised pumps has been effective. A mixture of unslaked lime (30 pounds), sulphur (20 pounds), and salt (15 pounds) has been successful in California against armored scales and in portions of the East also. The ingredients are placed together in a barrel with 30 or 40 gallons of water and boiled with steam for three or four hours The mixture should be diluted to 60 gallons and should preferably be applied hot. It leaves a limy coating which acts as a deterrent to the young scales, and when not washed off by rains it retains its value for several weeks. Whale-oil or fish-oil soap, preferably made with potash lye, is dissolved in water by boiling at the rate of two pounds of soap to a gallon of water and makes an excellent winter wash for armored scales. If applied hot and on a warm day in winter, it can easily be put on trees with an ordinary spray pump. On a cold day, however, it will clog. Many of the States have passed laws to prevent the introduction of nursery stock unless accompanied by a certificate from a State official or a recognized expert that it has been inspected and found free from scale insects or unless it has been fumigated with hydrocyanic acid gas. To perform this fumigation at a nursery a small air-tight fumigation house is usually constructed. See INSECTICIDE.



FLUTED SCALE.
a, full-grown female; *b*, same, after secretion of fluted egg sac.

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SCALES. Small plates arising from the skin and forming the covering or armature of the bodies of various animals, as fishes, lizards, snakes, and a few mammals. In fishes they are present in most forms as calcified plates in the skin, which may be so minute as to be almost microscopic, or in the form of large plates. Agassiz classified scales into placoid, ganoid, ctenoid, and cycloid and classified fishes into these four groups. The most primitive scales, found in the elasmobranchs, consist of a basal plate of dentine bearing a central spine, covered externally by an enamel coat. The former is derived from the derma, and the enamel is secreted by the epidermis. These are the placoid scales, and they show a great similarity in their structure and development to teeth (q.v.). In ganoid scales the basal portion is formed as in placoid scales and is covered by a coating of smooth, hard substance called ganoin. These are generally of a rhomboid form, as in the garpike (*Lepidosteus*). Both ctenoid and cycloid scales may occur within the same family, or even smaller group, so that their lack of importance as characters upon which to base a classification must be conceded. Among the Amphibia more or less calcified or ossified scales are entirely restricted to the Stegocephali and Apoda. Those of the former group (which is extinct) were small and partly calcified or perhaps ossified, "and we can only surmise," says Gadow, "that these scales were covered by corresponding dermal sheaths." The modern cæcilians have a partial scale armature which consists of calcareous cell secretions and is consequently an entirely mesodermal product of the deeper layers of the cutis. (See MOLTING.) Reptiles have from the earliest times been characterized by their coating of scales in most groups. The term in its ordinary sense, however, applies mainly to the covering of modern lizards and snakes. The scales of these creatures are formed by the cutis and have a horny epidermal covering, which peels off periodically when the skin is shed. In some lizards they are nearly absent; in many they contain osteoderms, or ossified portions of the cutis, over a part or all of the body. Snakes never have osteoderms. Well-developed scales overlap, but in some cases lie flat, edge to edge.

In birds, where a semblance of scales appears, as in the penguins, they are to be accounted for as modified feathers; and in scaly mammals, such as the manis and the scale-tailed squirrel (*Anomalurus*), the scales are formed of agglutinated hairs.

SCALES OF NOTATION. Systems for writing numbers have been formed with various bases; those known to have been used, in whole or in part, by civilized or semicivilized peoples are chiefly the quinary (scale of 5), denary (scale of 10), duodecimal (scale of 12), vicenary (scale of 20), and sexagesimal (scale of 60) systems. The binary system (scale of 2) was advocated by Leibnitz for scientific purposes. Such a system requires only the figures 0, 1, and reduces the fundamental operations to addition and subtraction. But these advantages are offset by the excessive repetitions of the digits to express ordinary numbers. Thus, 289 is expressed in the binary scale 100,100,001. The ternary and quaternary systems, the latter of which is known to have been used by certain savage tribes, are open to the same objection. The quinary system (scale of 5) probably originated in the practice of finger reckoning. (See FINGER SYMBOLISM.) It is known to have been used by many savage tribes, especially among the primitive South Americans and probably among the early Russians. The senary system (scale of 6), septenary (scale of 7), octary (scale of 8), and nonary

(scale of 9) may be said to exist in theory only. The denary scale as a system of numeration is practically coextensive with civilization. Like the quinary scale, it doubtless originated in the finger reckoning of primitive peoples. This system owes its popularity largely to the simplicity and power of the Hindu notation. The base 12 of the duodecimal scale may have been suggested by the 12 lunations in the solar year, but it is more probable that it was used to some extent because of the fact that 12 is factorable by 2, 3, 4, and 6, the factors 2, 3, and 4 being especially important in the early work with fractions. Its popularity among the Romans is well attested, and the dozen, gross, shilling, foot, and pound are evidences of its longevity. The notation for such a system would evidently require 12 figures and possess peculiar advantages. Thus, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$ of 12 units are all integral, while $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$ of 10 units are not. For manipulation and direct measurement which depend upon the convenient graduation of the measuring scale the duodecimal system is convenient, but for the other purposes of calculation the decimal scale is equally good. The primitive Scandinavians, the Caribbees, and the Mexicans seem to have used the scale of 20. The sexagesimal system (scale of 60) was undoubtedly suggested by the fact that the Babylonian priests made some use of the number in their astronomical calculations. Perhaps the Babylonians also divided their days into 60 equal parts, as is found in the Veda calendars of the ancient Hindus. This system was developed and used by the Greek astronomers, having been introduced by Hipparchus.

For the history of various scales, consult: E. B. Tylor, *Primitive Culture* (2 vols., New York, 1903); L. L. Conant, *The Number Concept* (ib., 1896), and the bibliographies there given. For doubts as to the commonly accepted origin of the sexagesimal system, consult Sayce and Bosanquet, "Babylonian Astronomy," in the *Monthly Notices of the Royal Astronomical Society*, vol. xi (London, 1880).

SCAL'IGER, skăl'ĭ-jẽr, Joseph Justus (1540–1609). A French classical scholar, son of Julius Cæsar Scaliger (q.v.). He was born at Agen in Guienne, whence he was sent to the College of Bordeaux. Forced by plague to return, he was for several years the pupil of his father. In 1558, upon the latter's death, he went to the University of Paris to study Greek under Turnebus (q.v.). After extensive travel, not only in Italy but in England and Scotland, he became a Protestant and spent four years with the jurist Cujacius (Cujas) at Valence, whose fine library gave Scaliger remarkable advantages. In 1572–74 he was professor at Geneva, but later he traveled in both France and Germany, until in 1593 he succeeded Lipsius at the University of Leyden (1593–1609). Scaliger was undoubtedly the most remarkable scholar since Varro. He first deduced and laid down in his treatise *De Emendatione Temporum* (Paris, 1583) a complete system of chronology formed upon fixed principles. This achievement secured for him the title of the Father of Chronological Science. Among the classical authors whom he criticized and annotated are Theocritus, Seneca (the tragedies), Varro, Ausonius, Catullus, Tibullus, Propertius, Manilius, and Festus. His other works are: *De Tribus Sectis Judæorum; Poemata; Epistolæ;* a translation into Latin of Arabian proverbs, etc.

Scaliger had believed himself descended from the noble family of Della Scala, of Verona, and had greatly prided himself upon his patrician origin; witness his *Epistola de Vetustate et Splendore Gentis Scaligeræ et J. C. Scaligeri Vita* (1594). In answer to this, Gasper Scioppius (q.v.), in his *Scaliger Hypobolimæus* (The Counterfeit Scaliger), sought to show that the so-called Scaligers were of base origin. The most illustrious and dignified scholar of modern times was thus held up to the ridicule of all Europe; his reply, *Confutatio Fabulæ Burdonum*, lacked effectiveness. Consult: Jakob Bernays, *Joseph Justus Scaliger* (Berlin, 1855); Mark Pattison, *Essays*, vol. i (Oxford, 1889); Nisard, *Les gladiateurs de la république des lettres* (Paris, 1889); J. E. Sandys, *A History of Classical Scholarship*, vol. ii (Cambridge, 1908); H. T. Peck, *A History of Classical Philology* (New York, 1911)

SCAL'IGER, skăl'ĭ-jẽr, Julius Cæsar (1484–1558). An Italian classical scholar, said to have been born at Riva on Lake Garda, Italy. Till 1526 Giulio Bordoni, as he was originally called, resided chiefly in Venice or Padua, studying medicine and natural science. In 1529 he went to Agen to practice medicine and resided there until his death. He left a mass of publications and a great reputation for the extent and depth of his learning. His best-known publications are: *Commentarii in Hippocratis Librum de Insomniis; De Causis Linguæ Latinæ Libri XVIII*, celebrated as the first considerable work written on the syntax of the Latin language in modern times; his Latin translation of Aristotle's *History of Animals; Exercitationum Exotericarum Liber Quintus Decimus de Subtilitate ad Hieronymum Cardanum;* seven books of *Poetics; Commentaries on Aristotle and Theophrastus;* two vituperative orations against Erasmus; Latin poems; etc. Leibnitz and Sir William Hamilton called Scaliger the best commentator on the physics and metaphysics of Aristotle. Consult: Pattison, *Essays* (Oxford, 1889); Nisard, *Les gladiateurs de la république des lettres* (Paris, 1889); Bourousse de Laffore, *Jules César de l'Escale* (Agen, 1860); Magen, *Documents sur Julius Cæsar Scaliger et sa famille* (ib., 1873); *Select Translations from Scaliger's Poetics by F. M. Paddelford* (New York, 1905); J. E. Spingarn, *Literary Criticism in the Renaissance* (ib., 1908); J. E. Sandys, *A History of Classical Scholarship*, vol. ii (Cambridge, 1908); H. T. Peck, *A History of Classical Philology* (New York, 1911). See also Scaliger, Joseph Justus.

SCALLOP, skŏl'ŏp (OF. *escalope*, from MDutch *schelpe*, Dutch *schelp*, shell; probably connected with Eng. *scalp, scale, shell*). A bivalve mollusk of the family Pectinidæ. The outline is regularly fan-shape, though one valve is often more convex than the other. The hinge is extended by ears, and in most species both valves have ribs radiating from the umbo to the margin. The animal has a small foot. Some of the species are capable of attaching themselves by a byssus; they are capable also of leaping by opening and rapidly closing the valves. Two species occur along the Atlantic coast of the United States—the common scallop (*Pecten irradians*) and the larger and handsomer Northern one (*Pecten islandicus*), which is sometimes 4 or 5 inches across,

the valves very much flattened and without radiating ridges; the latter species is found from Vineyard Sound northward, but is more common along the coast of Maine, Nova Scotia, etc. The common scallop is scarcely half the size of the other, the shell is considerably arched, and the radiating ridges are prominent. The scallop is in great demand as a delicacy, the large adductor muscle being the part specially sought after.

Careful and extended studies on the breeding habits of the scallop of Narragansett Bay have been made by Risser. It is a hermaphrodite, and the entire mass of eggs, probably more than a million, may be discharged in the course of an hour and a half. The breeding season is in June. The eggs, which may be artificially fertilized, are spherical and about $\frac{1}{6000}$ of an inch in diameter. The embryo begins to swim within 36 hours after fertilization, and the shells are formed when the young is 48 hours old, with the characteristic shape. The scallop spawns when one year old, when the average size is about 2½ inches from the hinge to the ventral margin. It is supposed that the scallop does not live more than two years, and it is evident that taking scallops less than a year old is most injurious to the industry. Scallops which are marked with the "line of growth" are those which have spawned. Although the ordinary scallop is regarded as a delicacy, the great Northern scallop (*Pecten tenuicostatus*), common in retired harbors on the Labrador coast and in the Gulf of St. Lawrence, is still more delicious eating.

Fossil scallops are common in the rocks of all formations above the Silurian. Consult Zittel and Eastman, *Textbook of Palæontology*, vol. i (London, 1900), and for embryology and culture, Risser, in *31st Report of the Commissioner of Rhode Island Fisheries* (Providence, 1901). See Colored Plate of Clams and Mussels.

SCALLOP. A device in heraldry. See Escalop.

SCALP (probably connected with MDutch *schelpe*, Dutch *schelp*, OHG. *sceliva*, dialectic Ger. *Schelfe*, shell, husk, scale, and ultimately with Eng. *shell*, *scale*). The term employed to designate the outer covering of the skull. Except in the fact that hair in both sexes grows more luxuriantly on the scalp than elsewhere, the skin of the scalp differs slightly from ordinary skin. Besides the skin, the scalp is composed of the expanded tendon of the occipito-frontal muscle and of intermediate cellular tissue and blood vessels. Injuries to the scalp are to be treated according to the usual antiseptic methods, with especial care to drainage, since any extensive suppurative process beneath the tendon of the occipito-frontalis muscle is likely to cause serious trouble. Cellulitis, abscess, and erysipelas are common complications of infected scalp wounds. Contusions are likely to cause an effusion of blood serum (cephalhæmatoma) between the bone and pericranium which is loosely attached to the skull except over the sutures. Tumor of the scalp is not uncommon, the most frequent being the sebaceous cyst popularly known as wen (q.v.) and the vascular tumor (nævus).

SCALPING. The custom of removing the scalp of a slain enemy, a practice originally restricted in North America to the Eastern and Central Algonquian tribes (except for the coastal strip between Maine and New Jersey), the Iroquois, and the Southeastern tribes including those of Florida, where scalping was well developed at the time of the discovery. From this Eastern area the usage spread over the entire plains, and still more recently into the plateau region. In South America there is one quite isolated scalping area in the Chaco and another in Guiana, which latter may be connected with the North American practice. The only satisfactory description of scalping in the Old World dates back to Herodotus' account of the Scythians. The reason for scalping seems to be that the scalp was the best possible evidence of the warrior's prowess and the most convenient souvenir for ornamentation and exhibition. According to Friederici scalping developed from the custom of taking the entire head as a trophy; when it was difficult to transport the head, a part took the place of the whole. Men, women, and children alike were scalped, but no scalp was ever knowingly taken from the living enemy. The scalp trophy consisted of the skin, with the hair attached, from the crown of the head over a circular diameter of about 4 inches. With the warriors of the tribes which practiced this custom the hair on this portion of the head was always permitted to grow its full length and was braided and ornamented with beads or other trinkets, it being held a point of honor not to shave the scalp lock. The scalp was removed by drawing the knife in a circle around the scalp lock and giving a strong pull. The scalp was then stretched on a little hoop to dry, after which it was painted on the underside with red paint and mounted at the end of a light rod, to be carried by the women in the subsequent scalp dance. It was afterward kept by the warrior between the covers of his shield, to be taken out on ceremonial occasions and fastened at his horse's bridle, or was put with the tribal "medicine," or perhaps sacrificed to the sun by hanging it upon a tree or pole in some lonely spot. If opportunity permitted, the remainder of the hair with the skin attached was taken at the same time to be divided into scalp locks for use as fringes upon war shirts or leggings.

The custom of scalping was adopted by the whites and extensively practiced, frequently with direct official encouragement, in all the border wars from King Philip's War down to within the latter half of the nineteenth century. The border fighters of a later period invariably scalped their slain Indians when opportunity permitted, and during the Revolutionary struggle both English and American officers encouraged their Indian allies in the practice by offers of bounties and rewards, even in some cases where the scalps taken were those of white people. The Mexican government formerly employed a company of American scalp hunters against the Apache at the fixed price of one ounce of gold per scalp. Scalps were taken by troops in the Modoc War in 1873. Consult Georg Friederici, *Skalpieren und ähnliche Kriegsgebräuche in Amerika* (Brunswick, 1906; Eng. trans. published by the Smithsonian Institution, Washington, 1907).

SCALY ANTEATER. See Manis.

SCAMAN'DER (Lat., from Gk. Σκάμανδρος, *Skamandros*). The ancient name of a river in the Troad, which, according to Homer, was also called Xanthus (Gk., yellow) by the gods. The Scamander rose in Mount Ida (q.v.) and, flowing west and north, discharged itself into the

Hellespont. In the *Iliad*, v, 774 ff., it is declared that the river Simoïs joined the Scamander, but this statement Leaf (see below) ejects from the text. Like most other points in Trojan topography, the identity of this river has been disputed. The Scamander is, perhaps, the modern Mendereh (this name has been regarded as a corruption of *Scamandros*, adapted to Turkish *dere*, a valley). Consult W. W. Leaf, *Troy: A Study in Homeric Geography* (London, 1912), and K. Baedeker, *Konstantinopel, Balkanstaaten, Kleinasien, Archipel, Cypern* (2d ed., Leipzig, 1914).

SCAMAN'DRIUS (Lat., from Gk. Σκαμάνδριος, *Skamandrios*). The son of Hector and Andromache, called Astyanax (q.v.) by the Trojans.

SCAM'MONY (OF. *scammonee, scamonee, scammonie*, Fr. *scammonée*, from Lat. *scammonea, scammonia*, from Gk. σκαμμονία, *skammonia*, scammony). A gum resin of an ashy-gray color, rough externally and having a resinous, splintering fracture. Scammony is derived from *Convolvulus scammonia* (natural order Convolvulaceæ), growing in Asia Minor, in Greece, and in the south of Russia. It is a perennial, with a thick, fleshy, tapering root 3 to 4 feet long and 3 to 4 inches in diameter, which sends up several smooth, slender, twining stems, with leaves shaped like arrowheads, on long stalks. All parts contain a milky juice. The scammony plant is not cultivated, but the drug is collected from it where it grows wild. The ordinary mode of collecting scammony is by laying bare the upper part of the root, making incisions, and placing shells or small vessels to receive the juice as it flows, which soon dries and hardens in the air. Few drugs are so uniformly adulterated as scammony, which when pure contains from 81 to 83 per cent of resin (which is the active purgative ingredient), 6 or 8 of gum, with a little starch, sand, fibre, and water. The ordinary adulterations are chalk, flour, guaiacum, resin, and gum tragacanth. The resin is soluble in alcohol and precipitated from its solution by water yielding a pure and tasteless product, stronger and more reliable than the powdered root. Mexican scammony from the root of *Ipomœa orizabensis*, while not absolutely identical, has largely replaced scammony. Scammony is an excellent and trustworthy cathartic of the drastic kind. The scammony mixture, composed of four grains of resin of scammony triturated with two ounces of milk until a uniform emulsion is obtained, forms an admirable purgative. Another popular form for the administration of scammony is the compound powder of scammony, composed of scammony, jalap, and ginger. Scammony is frequently given surreptitiously in the form of biscuit to children troubled with threadworms. See GUMS.

SCAMOZZI, skä-mŏt'sē, VINCENZO (1552–1616). An Italian architect, born in Vicenza. He studied under Sansovino in Venice. In 1582 he had become master of works of the Procuratie Nuove, completed the library of St. Mark's, and the façade of Palladio's church of San Giorgio Maggiore. At Rome in 1585 he came under the influence of Fontana and Bernini. His later works are in the baroque style; to an earlier and less ornate period belongs the Barbari monument in the church of the Carità at Venice, which first made him famous. He wrote *Idea dell' architettura universale* (1615). Consult *Life*, by Scolari (Treviso, 1837).

SCAMP, or BACALAO. A name in Florida for either of two species of grouper (q.v.), of the genus *Mycteroperca*, both excellent food fishes.

SCAN'DERBEG (from Turk. *Iskenderbey*), PRINCE ALEXANDER (c.1404–67). A celebrated patriot chief of Albania. His real name was George Castriota, and his father, John Castriota, was one of the hereditary princes of Epirus. In 1423 he was delivered to the Turks as one of the hostages for the allegiance of the Albanian chiefs, and his beauty and intelligence so pleased Amurath II that he was lodged in the royal palace and brought up in Islamism. Placed at the head of a Turkish force, he fled in 1443 with some 300 companions to his native country and by a stratagem made himself master of the town of Croia. At the news of his success the whole country rose in insurrection, and in 30 days he had driven every Turk, except the garrison of Sfetigrad, out of the country. He raised an army of 15,000 men with which he scattered (1444) a Turkish force of 40,000 men. Three other Turkish armies shared the same fate. The Venetians, too, were made to feel the power of the Albanian leader. Amurath II took the field in 1449 against Scanderbeg and stormed many of the principal fortresses, but was baffled at Croia (1450). Scanderbeg's splendid success brought him congratulations and substantial aid from the Pope and the sovereigns of Naples and Aragon. Mohammed II granted him favorable terms in 1461, and Scanderbeg thereupon entered Italy, where he maintained the cause of the Aragonese in Naples against the partisans of the house of Anjou (1461–62). At the instigation of the Pope he broke the truce with the Turks in 1464. Mohammed II dispatched two great armies for the reduction of Albania, and Croia was unsuccessfully besieged in 1466; but the restless and indomitable chief, worn out with incessant toil, died at Alessio on Jan. 17, 1467. The war continued, but the mainstay of the country was wanting, and before the end of 1468 the Turkish power had been established in Epirus. Scanderbeg is said to have vanquished the Turks in 22 pitched battles. Consult Pisko, *Skanderbeg* (Vienna, 1894), and Edward Gibbon, *Decline and Fall of the Roman Empire*, edited by J. B. Bury, vol. vii (new ed., London, 1912).

SCANDIANO, skän-dyä'nō, COUNT OF. See BOIARDO, M. M.

SCAN'DINA'VIA. A name generally used as a collective term for the three kingdoms of Norway, Sweden, and Denmark (including Iceland). The Scandinavian peninsula, as the term is more commonly used, includes only Norway and Sweden. The name Scandia was first employed by the Romans to designate a large island supposed to lie north of the Baltic Sea. This was probably southern Sweden, which still bears the name of Skåne and which was then not known to be connected with the mainland in the north.

SCANDINAVIAN LANGUAGES AND LITERATURE. See DANISH LANGUAGE AND LITERATURE; LANDSMAAL; NORWEGIAN LANGUAGE; NORWEGIAN LITERATURE; SWEDISH LANGUAGE AND LITERATURE.

SCANDINAVIAN MUSIC. Although the Scandinavian nations cultivated music assiduously from the earliest times, it was not until the nineteenth century that they developed a distinct national art which became an impor-

tant factor in the evolution of modern music. The art of the Flemish masters prevailed throughout the sixteenth century. Early in the seventeenth the Italians assumed the musical leadership, which towards the end of the same century passed over to the French. The early eighteenth century witnessed the beginning of German influences, which gradually became supreme. While the trained musicians surrendered to a foreign art, the common people clung to their store of folk songs and folk dances. The folk tunes of Denmark and Sweden, moving within our accepted major and minor modes, are less typical and striking than those of Norway, which preserve traces of older systems (Church modes, pure minor, whole-tone scale). The existence of a characteristic Scandinavian art dates from the appearance of Gade and Grieg (qq.v.) in the latter part of the nineteenth century. In the works of these two, and a number of lesser masters, a happy blending of German romanticism and the characteristics of national folk music has resulted in a distinctive style. Common to all Scandinavian composers is their predilection for the instrumental forms; and here, again, the smaller lyric forms predominate. The art music of each nation strikingly reflects the general character of its folk music, which in turn is conditioned by the physical aspect of the particular country. Thus, generally speaking, the music of Denmark exhibits serenity, tenderness, and grace; that of Norway, melancholy, grandeur, and ruggedness; whereas the art of Sweden participates in all these characteristics without, however, attaining the intensity of expression found in the music of the sister countries. Consult: H. Riemann, *Geschichte der Musik seit Beethoven* (Leipzig, 1901); A. Soubise, *Histoire de la musique: Etats scandinaves* (Paris, 1901); W. Niemann, *Die Musik Skandinaviens* (Leipzig, 1906). See Music; Music, *History of.*

SCANDINAVIAN (AND TEUTONIC) MYTHOLOGY. The old religion of the Germanic peoples. Teutonic mythology is so largely based on Scandinavian sources as to make the terms almost synonymous. The number of nature gods, with marked, strong individuality, is small; the proportion of spirits and demons, elves, dwarfs and giants, valkyries, swan maidens, and norns, unusually large. Most of these creations are mere folklore or poetic personifications rather than real mythic figures, founded upon a definite fact in outside nature or some permanent element in the inner consciousness of man.

The final conversion of the Northern Teutons to Christianity took place about 1000 A.D. The native sources of mythology are in general not earlier than that date, many of them much later. The *Elder* or *Poetic Edda* (see Edda) dates from the tenth century; the *Younger* or *Prose Edda* and the sagas are about two centuries later. Both these dates make it likely, first, that the native ideas on the subject are present in an advanced and tangled form, considerably removed from the mythic roots that started them; secondly, that there is a strong admixture of Christian and perhaps even classical ideas. There are indeed foreign influences in Scandinavian mythology, but, despite this non-Teutonic element, the mythology is essentially national in spirit and character.

The Scandinavian gods are anthropomorphic, like the Greek gods, but not so plastic as they. Their personality is rugged, even if they fall short in both the graceful fancy and the finished mastery of the Greek deities. In the main, however, the gods portray men: Odin (q.v.) is a powerful, shrewd, not unkindly old man; Loki is ill-tempered, fickle, deceitful, and calumniating; Balder is wondrously fair, beloved of all; Thor performs incredible deeds, but only when he has his hammer Mjöllnir; Frigg is Odin's housewife, the mother of Balder (q.v.). The gods are human in their needs and infirmities; they eat and drink—solemnly and copiously, as Teuton gods should. Odin has lost an eye, having pledged it for a draft from the fountain of Mimir, the source of all wisdom; Tyr has lost a hand; Balder perishes. Their character, their emotions, and such morality as they claim are entirely human. They are kind or ferocious, shrewd or foolish. Frigg, Odin's wife, is the highest representation of heavenly virtue; she is the severe, rather shrewish guardian of domestic virtue and sexual morality.

The absence of truly lofty traits, æsthetical or ethical, from the character of the gods is reflected in their worshipers. There is no piety, nor is there much faith beyond the assurance that the gods are likely to take a hand in the affairs of men. Neither gods nor men are always acting rightfully, nor are accursed deeds always avenged. Hence the gloomy idea of the so-called norns (q.v.). Over and above the natural sequence of either divine or human events, and above right and wrong, there is a higher inexorable law which dominates over gods and men alike. Hence, too, the power of gods and men is often dependent, not upon their inner quality, but rather upon external conditions or upon the possession of sundry magical objects. Odin's throne Hlidhskjálf enables him, or any one else who may happen to sit on it, to see all the world, and Thor's strength depends upon his hammer. The gods called Æsir (q.v.) fasten the hell wolf Fenrir (see Fenrir; Ragnarök) with the fetter Gleipnir, made out of the sound caused by the footfall of cats, of the beards of women, the roots of mountains, the breath of fish, and the spittle of birds.

The Edda furnishes an account of creation and of the Scandinavian Olympus, which presents a fair average of Teutonic ideas on these subjects. The first and eldest of the gods is Odin, the All-Father, who lives from all ages, rules over all his realm, heaven and earth, and man. All the righteous shall live and be with himself in Valhalla (q.v.); but the wicked fare to Hel and thence into Niflheim (q.v.) or Niflhel, beneath in the ninth world. At first neither heaven nor earth existed, only a yawning abyss. Then the giants made a citadel for the gods called Asgard (q.v.), to which gods ascended by the rainbow bridge called Bifröst (q.v.). There Odin sits in his high seat. His wife is Frigg, and their offspring are the Æsir (q.v.). Odin's first son is Thor (q.v.), the strongest of the gods. He has a hammer, called Mjöllnir, a strength belt, and iron gloves that he may hold his hammer's haft. Balder is Odin's second son, fair and beautiful and praised by all. Tyr (q.v.) is daring and stanch, while Bragi (q.v.) is famous for wisdom, clever in speech and song craft. Among others who are good and great are Heimdalr (see Ragnarök), Hoenir, Vidharr, and Vali. Loki (q.v.), fair of

face, ill in temper, and fickle of mood, is called the backbiter of the Æsir, the speaker of evil speech and shame of all gods and men, whom he constantly deceives. The highest seat of the gods is at the ash tree Yggdrasill (q.v.). One of the three roots of this "world tree" goes to heaven to the Æsir. A second reaches to the winter giants. Under that root is the spring of Mimir (q.v.), Odin's uncle. There, once upon a time, came Odin and begged a drink. His wisdom was exhausted, and the end of things seemed near. Mimir asked for the eye of Odin as a pledge, which the god sacrificed. The third root reaches to lowest hell. A fair hall stands under the ash by the spring, and out of it come the three norns Has-been (*Urdhr*), Being (*Verdhandi*), and Will-be (*Skuld*) and grave on a shield the destiny of men.

The heroes that have fallen in battle, from the beginning of the world, go to Odin in Valhalla. Odin's battle maidens, the valkyries, protect his favorites and grant them victory. But when their day has come the valkyries, who have hitherto been invisible, reveal themselves and conduct the fallen heroes to Valhalla. There they eat of the flesh of the boar Soehrimnir every day and drink the mead from the goat Heidhrunr. Every day the heroes put on their armor and fight with each other for their sport. At evening they ride home to Valhalla and sit down to eat and drink. But an uncertain future throws its shadow even over the citadel of the gods, for no one knows when the enemies of the Æsir will break their bonds and cause the downfall of the world. See RAGNARÖK.

Only a small stock of the Teutonic divinities can be traced with certainty to the Indo-Germanic period. In Scandinavian *tivar*, a collective designation of the gods, and in the name *Tyr*, OHG. *Zio*, we have the shining sky god of the prehistoric myth, reflected by Skt. *devas*, Lith. *dëvas*, OIr. *dia*, god, Lat. *dīvus*, divine. The direct equation of *Tyr*, *Zio*, with Vedic *Dyāuṣ pitar*, Gk. Ζεύς πατήρ, Lat. *Jupiter* (q.v.) has been questioned, but there is no doubt that *Tyr*, *Zio*, is the prehistoric sky and day god. The Scandinavian *Æsir*, Ger. *Asen*, another generic designation of the gods, points with great certainty, through Skt. *asu*, life, spirit, Av. *aṁhu*, lord, to the *Asura-Ahura*, the highest generic name for Indo-Iranian divinities. *Odin* or *Wotan* may not be severed from the Vedic storm god *Vāta*, wind. Slight phonetic obscurities notwithstanding, the Scandinavian god and goddess *Fjörgynn* and *Fjörgyn* are identical with the Lith. *Perkunas*, Vedic *Parjanya* (q.v.), god of thunder. Less certain, though probable, is the connection of the words for *elf* (AS. *ælfr*, Scand. *alfr*) with the *ṛbhu* (see RIBHUS) of the Veda. Both types of divinities are famed for skill rather than strength; they are probably divinities of light, connected with the fashioning of the seasons and the year.

In the common Teutonic period three mighty gods and one goddess were worshiped—Tyr, Odin, Thor, and Frigg. Four days of the week—Tuesday, Wednesday, Thursday, and Friday—were consecrated to them. Tyr, the ancient sky god, became a war god and lost his early importance. Wodanaz (Scand. Odin) was originally a storm god. In the belief of the Germans he figures as the leader of the Furious Host, or Wild Hunt. The souls of the dead are thought to sweep with him through the air, so he becomes the leader of the souls and god of the dead. He develops also into a god of war and finally in the Scandinavian North into the head of Valhalla, creator, orderer of the world, and god of wisdom. Each day he lets fly his two ravens, Huginn and Muninn, thought and memory; when they return they alight upon his shoulders and tell him of all that comes to pass and all that is to be.

The most popular god of Scandinavia is Thor. His mother is Fjörgyn, a female personification of thunder, and he is himself thunder personified. He is surnamed Hlorridhi, roarer; his hair and beard are red, typifying the lightning, and he wields the hammer Mjöllnir, which returns of itself to the hand of the god after crushing his enemies. In many myths he is the chief defender of the heavenly citadel Asgard against the attacks of the giants. He is a popular god in distinction from the more aristocratic Odin, being simple and rough, passionate, and devoted to eating and drinking. Thor's picture is carved on the seat of honor of the master of the house, to bring comfort and prosperity to the household.

The last of the Teuton divinities to whom was consecrated a day of the week is Frigg, the wife of Odin. With him she surveys, from his seat Hlidhskjālf, the whole universe, and knows, as Odin's confidante, the fates of men. She is in charge of marriage, of housewifely success and happiness, and of marital fidelity. Sterile women pray to her for children, and she gives aid in the throes of childbirth. Veiled, with a distaff in her hand, and a bunch of keys at her side, she typifies the true Teuton housewife. She is the devoted mother of Balder and weeps when he is slain. The Scandinavian myth has created a goddess, Freyja (q.v.), in addition to Frigg, as a female abstraction, or sister, of the male god Freyr. The latter is one of the Vanir, a class of gods who appear to be in some kind of opposition to the Æsir. As Freyr is a god of love and fruitfulness, his female counterpart Freyja is the fairest of goddesses, beneficent, and invoked in affairs of love, and is invoked in company with Frigg.

The two most important remaining characters of Scandinavian mythology are Balder and Loki. Balder, the son of Odin and husband of Nanna, is the darling of the gods. He is so fair that light streams from him and the whitest of all flowers is likened to him. He has an evil dream of impending danger, and therefore Frigg, his mother, puts all animate and inanimate things under a vow not to harm Balder. On the field the gods, certain not to hurt him, begin to throw all sorts of objects at him. Nothing harms him. Loki changes into a woman and extracts from Frigg the information that she had put all things under a vow, except the mistletoe, which was too young to be able to do him harm. Loki then puts the mistletoe into the hands of Hödhr, Balder's brother, to shoot as an arrow. The missile hits the mark, and Balder falls dead. The kernel of the myth is probably the vanishing of the summer sun in winter. Balder, god of physical light, has become the emblem of purity and innocence. Balder's death ushers in the destruction of the world in Ragnarök (q.v.).

Loki is deceitful and malicious in character, and his naturalistic basis is problematical. He appears only in the Scandinavian myth. Though

he often goes in the company of the gods, himself one of the Æsir, yet on the whole, whatever his origin, Mephistophelian deviltry is a constant element of his character. Both his origin and name have been traced to Lucifer. His part in Balder's death has been shown above. Loki once ate the heart of a courtesan, became pregnant thereof, and gave birth to monsters, the wolf Fenrir, the serpent Midhgardhr, and Hel (q.v.), the goddess of death. As a boatswain upon a ship he leads the dark powers against the Æsir at Ragnarök. No Teutonic god has been explained more variously, as Fire, as the equivalent of the Vedic demon Vritra, as Prometheus, Vulcan, Lucifer, and other types. His name is supposed to mean "the closer," a vague and doubtful appellation. It seems likely that he contains at least in part a demonic personification of fire, and as such Richard Wagner pictured him in his Nibelungen tetralogy.

Bibliography. Wilhelm Müller, *Geschichte und System der altdeutschen Religion* (Göttingen, 1844); J. W. Wolf, *Beiträge zur deutschen Mythologie* (ib., 1852–54); Wilhelm Mannhardt, *Germanische Mythen* (Berlin, 1858); id., *Die Götterwelt der deutschen und nordischen Völker* (ib., 1860); Adolf Holtzmann, *Deutsche Mythologie* (Leipzig, 1874); R. B. Anderson, *Norse Mythology* (Chicago, 1875; 7th ed., 1901); Jakob Grimm, *Deutsche Mythologie* (4th ed., Berlin, 1875–78); Karl Simrock, *Handbuch der deutschen Mythologie* (6th ed., Bonn, 1878); R. B. Anderson, *Mythologie scandinave* (Paris, 1886); Hahn, *Odin und sein Reich* (Berlin, 1887); Rydberg, *Teutonic Mythology* (Eng. trans. by R. B. Anderson, London, 1889; same also in 3 vols., ib., 1906); E. H. Meyer, *Germanische Mythologie* (Berlin, 1891); F. B. Gummere, *Germanic Origins* (New York, 1892); W. Golther, *Handbuch der germanischen Mythologie* (Leipzig, 1895); H. A. Guerber, *Myths of Northern Lands* (New York, 1895); Eugen Mogk, "Germanische Mythologie," in Paul, *Grundriss der germanischen Philologie*, vol. ii (2d ed., Strassburg, 1898); Sophus Bugge, *Home of the Eddic Poems* (Eng. trans. by W. H. Schofield, London, 1898); Chantepie de La Saussaye, *Religion of the Teutons* (Eng. trans. by B. J. Vos, Boston, 1902); E. H. Meyer, *Mythologie der Germanen* (Strassburg, 1903); Friedrich Kauffmann, *Northern Mythology* (Eng. trans. by M. S. Smith, London, 1903); K. A. Martensen, *Handbook of Norse Mythology* (New York, 1913).

SCANDINAVIANS. People of the Scandinavian group of the Teutonic stock, consisting of the Norwegians, Swedes, Danes, and Icelanders. They are long-headed blonds. Prehistoric remains shows that Scandinavia was settled in the Neolithic Stone age, probably by migrants from the Eurasian steppes who followed a more northern route than the Slavs and developed the physical characters which are noticeable in the Teutonic stock. Scandinavia is believed by many to be the true home of the Teutonic race. These original migrants were the Gotar and Svear, who are now collectively grouped as the Scandinavians.

The settlement of Scandinavia began after the retreat of the ice cap of the Glacial period; hence the earliest and by far the most abundant traces of Neolithic man are found in the southern portion. Nowhere is the sequence of culture periods more orderly than in this region, and from this fact the students of Scandinavia have been foremost in giving to the science of archæology a sequential basis. The burial places of the Polished Stone age in southern Sweden and Norway consist of dolmens, stone graves, and mounds; funeral chambers with galleries and kitchen middens (q.v.) are also found. The Bronze age brought in a higher civilization, and through this age and the succeeding age of iron to the historic period may be traced an increasing culture. With the Iron age came the alphabet and the writing of runes, the use of which survived in Gothland till the sixteenth century. The Scandinavians appear in history at the time of the sea-roving expeditions, when they came in actual contact with many civilized nations and carried back to the north coins and art works of these nations. The trade in amber, which followed a well-known route, also had its effect upon the culture of Scandinavia. The inexhaustible supply of food, especially of fish, gave rise to early commerce between the peoples of this region and the nations to the south, explaining largely the diffusion of foreign culture in Scandinavia. The Swedes have taken less of blending than the Norwegians or Danes and preserve the best type of the early migrants, especially in the Dalecarlians. The only foreign types of the region are the Lapps and the settlements of shortheads on the west coast of Norway.

Consult: P. B. Du Chaillu, *The Viking Age* (2 vols., New York, 1889); C. F. Keary, *The Vikings in Western Christendom* (ib., 1891); Sten Konow and Karl Fischer, *Norway, Official Publication* (Christiania, 1900); J. Guinchard, *Sweden* (Stockholm, 1900; Ger. trans., 1900; 2d ed., 2 vols., ib., 1914; Ger. trans., 1914); Oscar Montelius, *Kulturgeschichte Schwedens von den ältesten Zeiten* (Leipzig, 1906), much better than his earlier work which has been translated *Civilization of Sweden in Heathen Times* (London, 1888).

SCAN'DIUM (Neo-Lat., from *Scandinavia* + *-ium*). A chemical element whose oxide was discovered by Nilson in 1879, after Mendeléev had, a decade previously, predicted that an element having the properties of scandium, and which he provisionally named ekaboron, would some time be found in nature. (See GERMANIUM; PERIODIC LAW.) Scandium is found in a number of rare minerals, including thorite, monazite, orthite, thortveitite, gadolinite, cerite, and others. The element (symbol, Sc; atomic weight, 44.1) forms an oxide of the formula Sc_2O_3 and a series of well-defined salts.

SCANZONI VON LICHTENFELS, skäntsō'nĕ fŏn lĭk'ten-fĕls, FRIEDRICH WILHELM (1821–91). A German gynæcologist and obstetrician. Born at Prague, where he took the degree of M.D. in 1844, he traveled and studied in France and Germany and from 1850 to his retirement in 1887 was professor of obstetrics and gynæcology at Wurzburg. Scanzoni emphasized the importance of pathological anatomy, introduced careful methods of examination, and demonstrated an improved technique in many operations, but he was a leading opponent of Semmelweiss (q.v.). Among his writings are: *Lehrbuch der Geburtshilfe* (3 vols., 1849; 4th ed., 1867); *Die geburtshilflichen Operationen* (1852); *Compendium der Geburtshilfe* (1854; 2d ed., 1860); *Die Krankheiten der weiblichen Brüste und Harnwerkzeuge* (1855; 2d ed., 1859); *Lehrbuch der Krankheiten der weiblichen Sexualorgane* (1857; 5th

ed., 1875; Eng. trans., *A Practical Treatise on the Diseases of the Sexual Organs of Women*, 1867); *Die Chronische Metritis* (1863); *198 Fälle von Beckenenge* (1882).

SCAPA, skā'pà. The popular designation of the Society for Checking the Abuses of Public Advertising, in London, founded for the purpose of restraining, through legislation and social influence, the disfigurement of towns and rural districts by glaringly hideous business announcements. It has been fairly successful in London, where it has been instrumental in abolishing certain abuses, mostly the obnoxious sky signs.

SCAPH'OID BONE (from Gk. *σκαφοειδής, skaphoeidēs*, boat-shaped, bowl-shaped, from *σκάφη, skaphē, σκάφος, skaphos*, boat, bowl + *εἶδος, eidos*, shape). A term applied to a somewhat boat-shaped bone in the carpus or wrist (see HAND) and in the tarsus of the foot (q.v.).

SCAPHOP'ODA (Neo-Lat. nom. pl. from Gk. *σκάφη, skaphē, σκάφος, skaphos*, boat, bowl + *πούς, pous*, foot). A class of mollusks, represented by the tooth shells (*Dentalium*). The scaphopods are intermediate between the gastropods and pelecypods. The shell is white, very long and slender, slightly curved, and open at both ends. The scaphopods are found in shallow water near shore, chiefly in the warmer parts of the world. Fossil scaphopod shells are known from Paleozoic rocks, but they were not common until the Cretaceous.

SCAP'OLITE GROUP. A group of mineral species crystallizing in the tetragonal system and including silicates of aluminium with calcium and sodium. The chief minerals are meionite, wernerite, mizzonite, and marialite. The minerals of the group are often components of basic igneous rocks, frequently found in lavas. They also occur in metamorphic rocks, such as crystalline limestone, where they are most frequently found near the contact with granite or other igneous rocks.

SCAP'ULA (Lat., shoulder), or SHOULDER BLADE. A flat triangular bone, which, when the arm hangs loosely down, extends posteriorly and laterally from the first to about the seventh rib. It presents an outer convex and an inner concave surface, three borders (a superior, an inferior or axillary, and a posterior), three angles, and certain outstanding processes.

Its outer, or posterior, surface is divided into two unequal parts, the supraspinous fossa and the infraspinous fossa, by the spine, a crest of bone commencing at a triangular surface on the posterior border and running across towards the upper part of the neck of the scapula, after which it alters its direction and projects forward so as to form a lofty arch, known as the acromion process, which overhangs the glenoid cavity, or receptacle for the head of the humerus. This acromion serves to protect the shoulder joint as well as to give leverage to the deltoid muscle. It is this process and muscle which give to the shoulder its natural roundness. From the upper part of the neck proceeds a curved projection, called the coracoid process, from its supposed resemblance to the beak of a raven. It is about 2 inches long and gives attachment to several muscles. The upper border of the scapula presents a notch, which in the recent state is bridged over with a ligament and transmits the suprascapular nerve. This bone articulates with the clavicle and humerus and gives attachment to 16 muscles, many of which, as the biceps, triceps, deltoid, and serratus magnus, are very powerful and important.

SCAP'ULAR (ML. *scapularium, scapulare*, from *scapularis*, pertaining to the shoulders, from Lat. *scapula*, shoulder). A portion of the monastic habit in certain religious orders. It consists of a long strip of serge or stuff which passes over the head, one flap hanging down in front, the other behind. With the growth of pious confraternities of people living in the world, but affiliated with the religious orders, the practice grew up and is usual to-day among devout Roman Catholics of wearing a small scapular, which is simply two little pieces of cloth joined by strings. The scapular was regarded as in a measure the symbol and substitute for the entire monastic habit. These scapulars are of different colors according to the confraternities of which they are the badges. The oldest and most widespread of such associations is that of Our Lady of Mount Carmel, founded by St. Simon Stock, sixth general of the Carmelites (q.v.), in 1251, as a consequence of a revelation. The granting of the scapular is generally a privilege of religious orders, and the wearing of them is encouraged by many indulgences. By benediction they acquire the character of sacramentals (q.v.).

SCARAB. See SCARABÆUS.

SCAR'ABÆ'IDÆ (Neo-Lat. nom. pl., from Lat. *scarabæus*, beetle; connected with Gk. *κάραβος, karabos*, Skt. *śarabha, śalabha*, locust + Gk. *εἶδος, eidos*, form), or CHAFERS. A family of beetles of the lamellicorn group, many of remarkable size and strange structure. About 13,000 species are already known, and about 300 new species are described each year. The leaflets of the antennæ are well adapted to each other and may be separated; the number of visible ventral segments of the abdomen is six. The family is divided into five subfamilies: Coprinæ, Melolonthinæ, Rutelinæ, Dynastinæ, and Cetoniinæ. The Coprinæ (about 5000 species) have already been treated under DUNG BEETLE. The Melolonthinæ (4000 species) resemble the common May beetle, and their larvæ, for the most part, live beneath the surface of the ground and feed upon the roots of various plants, frequently doing great damage to pasture land. The rose chafer (see ROSE INSECTS) is a prominent representative of this group. Many of the adult beetles feed upon leaves of trees and smaller plants, but some, usually found upon flowers, feed upon pollen and are of some service in the cross-pollination of plants. The Rutelinæ (about 1500 species) are insects of brilliant metallic colors and are more abundant in tropical than in temperate regions. Their larvæ resemble those of the Melolonthinæ. Well-known examples of this group in the United States are the goldsmith beetle (*Cotalpa lanigera*), the spotted vine chafer (*Pelidnota punctata*), and the wonderfully beautiful *Plusiotis gloriosa*, from Arizona, which is pale green in color and has the margins of all parts of the body and broad stripes on the elytra of a pure polished gold color. It is one of the most beautiful beetles in the world and is figured on the Colored Plate of BEETLES. The Dynastinæ, which comprise many very conspicuous insects, include only about 1000 species, among which are some of the largest insects in existence, especially in the genera *Dynastes* and *Megasoma*. The males of these genera and

others bear large horns upon the head and prothorax, the use of which in the economy of the species cannot be conjectured. Their larvæ are usually strongly curved and feed upon decaying vegetable matter. The Cetoniinæ (about 1600 species) occur mostly in the tropical regions of the Old World. During flight the elytra of these beetles remain closed, the wings extending out from beneath the base of the wing covers. Some of the species eat honey, others overripe or decaying fruits, and others lick the sap from wounded trees. To this group belong the sap chafer, the goliath beetle, and the June beetle (qq.v.) of the southern United States. Both adults and larvæ of some species live in ants' nests. See BEETLE; CHAFER; see also Figs. 7 and 9 of Plate BEETLES; also the figure of larva of a beetle in the article BEETLE, which is a good example of the scarabæid type of larva.

SCAR'ABÆ'US (Lat., beetle). A black or metallic colored dung beetle, the *Ateuchus sacer* or *Scarabæus ægyptiorum*, common in Mediterranean countries and especially in Egypt. The Egyptian name of the insect was *kheper*, from a stem meaning "to become, to come into being," and a picture of the beetle was the usual ideographic sign for the verbal stem and its derivatives. The Egyptians believed that no female of the species existed, but that the male, contravening the ordinary law of generation, himself produced the egg and thus perpetuated his existence by his own act. The scarabæus, therefore, became the type and emblem of all self-begotten deities and in particular of the god Kheperi, whose name signifies "he who is (in process of) becoming." This deity typified the rising sun, renewing its birth each morning, and he is usually represented as a man with a scarabæus upon, or in place of, his head. The scarabæus was also the type of the human soul emerging from the mummy, just as the beetle emerged from its egg, and flying upward to heaven, and thus the insect became a symbol of the resurrection and of immortality. From a very early period scarabæi, carved out of metal or of stone or molded in faïence, were used as amulets. They were inscribed with religious texts, with the names of deities or famous kings, or with symbolic magical devices, and were worn by the living or placed upon the mummies of the dead. Such carved scarabæi are usually called scarabs, and large numbers of them have been found dating from nearly all periods of Egyptian history. In the earlier specimens the wings are folded; in later times the beetle is not infrequently represented with the wings extended. In the mummy a large scarab, inscribed with a particular chapter of the *Book of the Dead* (q.v.), usually replaced the heart of the deceased, which was removed during the process of embalmment. By virtue of this amulet the deceased was enabled to pass the ordeal of the weighing of the heart at the final judgment. Consult: K. A. Wiedemann, *Religion of the Ancient Egyptians* (New York, 1897); W. M. Flinders Petrie, *Historical Scarabs* (London, 1899); John Ward, *Sacred Beetle: Treatise on Egyptian Scarabs* (New York, 1902); P. E. Newbury, *Scarabs* (ib., 1906). See DEAD, JUDGMENT OF THE.

SCARAMOUCH, skăr'ȧ-mouch (Fr. *scaramouche*, from It. *scaramuccia*, skirmish). A character in the old Italian comedy, originally derived from Spain, representing a military poltroon and braggadocio. He was dressed in a sort of Hispano-Neapolitan costume, entirely black, with a mask open on the forehead, cheeks, and chin, and regularly received an inglorious drubbing at the hands of Harlequin or Polichinelle. The most celebrated actor of the character was the Neapolitan comedian Tiberio Fiorilli (1608–96), who lived in France after 1640 and was better known as Scaramouche than by his own name.

SCARBOROUGH, skär'brō *or* skär'bŭr-ō. A seaport and health resort, popularly called the Queen of English Watering Places, in Yorkshire, England, in the North Riding, 37 miles northeast of York (Map: England, F 2). The town is built in successive terraces and crescents on rising ground around two beautiful bays divided by a promontory ending in a castle-crowned height, which looks out on the North Sea. Two bridges span the picturesque ravine of Ramsdale valley and connect the central or ancient part of the town with its large and fashionable southern suburb. There is a fine promenade pier, an elegant spa and gardens on the south cliff, and the tidal harbor, inclosed by three piers, has a lighthouse and floating dock. The chief buildings are an extensive aquarium, museum, and market hall. The municipality owns considerable real estate and the water and gas supplies and has built a marine drive and sea wall around the castle 2¼ miles in length. There are manufactures of jet, a coasting trade, and lucrative fisheries. The castle was erected about 1136. Here Piers Gaveston (q.v.) was besieged by the barons in 1312. It was twice besieged by the Parliamentary forces; it was also bombarded by the German fleet in December, 1914. (See WAR IN EUROPE.) It serves as a barrack and is fortified by batteries. Pop., 1901, 38,200; 1911, 37,224. Consult Haviland, *Scarborough as a Health Resort* (London, 1884).

SCARIA, skä'rē-ȧ, EMIL (1838–86). An Austrian dramatic bass singer, born at Graz. He made a successful début in 1860, at Pest, as Saint-Bris in *Les Huguenots*. In 1862 he went to London to finish his studies under García. Afterward he was engaged at Dessau, Leipzig, Dresden, and finally at the Court Opera in Vienna. He was a most remarkable bass and was celebrated as an interpreter of Wagner, creating the rôle of Wotan at Bayreuth in 1876 and Gurnemanz (*Parsifal*) in 1882.

SCAR'IDÆ (Neo-Lat. nom. pl., from Lat. *scarus*, from Gk. *σκάρος*, *skaros*, sort of sea fish). A large family of tropical bony fishes comprising the parrot fishes (q.v.). The body is oblong with large scales and often gorgeously colored.

SCARLATINA, skär'lȧ-tē'nȧ. See SCARLET FEVER.

SCARLATTI, skär-lät'tē, ALESSANDRO (1659–1725). An Italian composer, born at Trapani in Sicily. In 1680 Scarlatti visited Rome and composed his first opera, *L'Onestà nell' Amore*, first performed at the court of Queen Christina of Sweden. His opera *Pompeo* was performed at Naples in 1684. In 1693 he composed the oratorio *I Dolori di Maria Sempre Vergine* and the opera *Teodore*, in which (so far as known) orchestral accompaniments were first introduced to the recitatives, and a separate design was given to the accompaniments of the arias. In the following eight years, during part of which time he was *maestro di capella* at Naples, he produced various operas, the most remarkable being *Laodicea e Berenice*, composed in 1701.

Between 1703 and 1709 he was *maestro di capella* at Santa Maria Maggiore at Rome; he then returned to Naples and in 1715 produced *Il Tigrane*. His musical works comprise 115 operas, several oratorios, and a great deal of Church music, besides various madrigals and other chamber music. He was the founder of the Neapolitan school, in which were trained most of the great musicians of the eighteenth century. His modulations, often unexpected, are never harsh and never difficult for the voice. He is supposed to have been the first composer or musician to divide the strings into four parts. His instrumentation is both bold and skillful, and his orchestration shows that he had a knowledge and appreciation of the art of grouping instruments of differing timbre which was remarkable for his time. Consult E. J. Dent, *Alessandro Scarlatti, his Life and Works* (London, 1905)

SCARLET (OF. *escarlate*, Fr. *écarlate*, from ML. *scarlatum*, scarlet, scarlet cloth, from Pers. *saqalāt, sīqalāt, suqlāt*, scarlet cloth). A vivid red color, inclining towards orange. It was formerly obtained exclusively from the cochineal (q.v.) insect, treated with zinc chloride and cream of tartar, but it is also now derived from coal tar (q.v.). It is frequently used in the fine arts and in dyeing and, like purple, was esteemed a color particularly suitable for costly attire.

SCARLET CUP. See PEZIZA.

SCARLET FEVER, or SCARLATINA (Lat. *scarlatum*, scarlet). One of the exanthemata; an acute febrile infectious disease characterized by sore throat and a general erythematous rash. Its onset is sudden, with vomiting and high fever. Scarlatina is marked by the number and severity of the complications which may accompany it. The ears may be attacked and deafness result, either from suppuration of the middle ear or from invasion of the internal ear. The cervical glands may become enormously enlarged and suppurate. Acute nephritis is a common complication, and endocarditis may supervene. The stage of incubation is short; an attack may begin 24 hours after exposure, but observers are not agreed as to the period of incubation, some placing it at 12 days. The disease is spread by desquamation and by discharges from the nose, throat, and ears. These secretions become dried upon clothing, bedding, etc., and unless they are disinfected they harbor the disease for long periods. The infectious agent is thought to be a streptococcus. No investigators have proved that scarlatina is a bacterial disease, while on the other hand there is evidence in favor of considering it a protozoan disease. All the suppurative complications, however, are due to the streptococcus, and these germs are found abundantly in the throat, ears, lymphatic glands, and sometimes in the blood. Several varieties of scarlatina are recognized: (1) a fulminating form, in which the patient dies in from 24 to 48 hours; (2) a malignant form, with high temperature and severe angina; (3, 4) moderately severe types, with certain slight differences in the distribution of the rash and the severity of the throat symptoms; (5) a variety characterized by severe throat inflammation, but with a slight or no rash (*scarlatina sine eruptione*). A typical attack of scarlet fever in a child may be described as follows: there is a sudden attack of vomiting with slight headache; a feeling of chilliness and a sore throat. In infants the seizure may begin with a convulsion. The characteristic eruption, appearing first on the chest, is observed in from 3 to 14 hours after the vomiting; the temperature reaches from 103° F. to 104° F. and gradually drops to normal within five or six days. The tongue presents a characteristic appearance—the so-called strawberry tongue—due to prominence of the papillæ, which are reddened and raised above the surrounding surface. The skin is hot and dry, the face flushed, and the eyes bright. The mortality varies in different epidemics from 5 to 20 or 30 per cent, and in infants it may reach 50 per cent. The patient should be isolated until desquamation is complete, and if complications are present, such as rhinitis, purulent otitis media, or suppurating glands, segregation should be prolonged until these are cured. Treatment is symptomatic and should be directed towards the anticipation and prompt treatment of impending complications. Rest in bed, a fluid diet, cold sponging to reduce the fever, and the inunction of antiseptic ointments to remove the drying epithelial scales are important. All secretions and excretions should be disinfected and destroyed, and bedding and the like disinfected. During convalescence tonics such as cod-liver oil and iron are indicated. The injection of antistreptococcus serum has been used to prevent and combat complications, but the results cannot be said to have proved satisfactory.

SCARLET GRAIN. See KERMES.

SCARLET LETTER, THE. A novel by Nathaniel Hawthorne (q.v.).

SCARLET SNAKE. A brilliant red snake (*Osceola elapsoidea*) marked with jet-black, white-bordered rings, dwelling in the southern United States; it is allied to the milk snake.

SCAR'LETT, SIR JAMES YORKE (1799–1871). An English general. He was the second son of James Scarlett, Baron Abinger, was educated at Trinity College, Cambridge, entered the army, was gazetted major of the Fifth Dragoon Guards in 1830 and colonel of the regiment in 1840. When the war with Russia broke out he was given command of the Heavy Brigade and fired his first shot before Sebastopol in 1854. During the battle of Balaklava, on October 25, Scarlett, receiving news of an attack from the Russians, moved on to Kadiköi, where he was surprised by the enemy, 2000 strong. In order to save his troops from annihilation Scarlett led 300 of his men up the hill into the centre of the Russian ranks and, supported a little later by 400 of the remaining squadrons, broke through and scattered their forces. Later in the day Lord Lucan prevented him from making a second charge with his brigade. It was on this occasion that the Light Brigade made its celebrated charge. Scarlett was promoted major general and made K.C.B. for his services at Balaklava. In 1855 he succeeded Lord Lucan as commander of the British cavalry in the Crimea. At the close of the war he was given the command of the Aldershot camp, which he retained until his retirement from active service in 1870.

SCARLET TANAGER, or FIREBIRD. See TANAGER, and Colored Plate of SONG BIRDS.

SCARP. The slope of the ditch next to the parapet. See COUNTERSCARP; ESCARP; FORTIFICATION; REDOUBT.

SCARPA, skär'pä, ANTONIO (1747–1832). An Italian anatomist and surgeon, born at Motta, near Treviso. Educated at Padua and Bologna, he became professor of anatomy at Modena (1772) and at Pavia (1783), where he

was director of the medical faculty after 1814. From 1796 to 1812 also he was director of the department of surgical education in the Cisalpine Republic. He became one of the greatest of European clinical surgeons, especially celebrated for ability to illustrate his anatomical as well as his surgical works—witness his *Tabulæ Neurologicæ* (1794). He wrote also on his discovery of the membranous labyrinth, on hernia, on diseases of the eye, etc. Perhaps Scarpa's greatest achievement was to demonstrate that the heart is supplied with nerves and that arteriosclerosis is a lesion of the inner coats of the arteries. He died in Pavia after being blind for many years. Scarpa's triangle is bounded by the adductor longus, the sartorius, and the crural arch. It is so named because Scarpa first tied the femoral artery in it for popliteal aneurism.

SCARPACCIA, skär-pät'chȧ. See CARPACCIO.

SCARPANTO, skär'pȧn-tō (Lat. *Carpathus*, Gk. *Κάρπαθος*, *Karpathos*). An island of the Ægean Sea under Italian rule since 1912. It is situated midway between the islands of Rhodes and Crete (Map: Turkey in Asia, A 3). It is 31 miles long and 8 miles in extreme breadth. Area, 126 square miles. It has bare mountains, reaching a height of 4000 feet. There are ruins of towns in several places. Pop., about 8000, mostly Greek workers in wood and fishermen. Chief town, Aperi.

SCARPE. In heraldry (q.v.), a diminutive of the bend sinister, half the width of that ordinary.

SCARRON, skȧ'rôn', PAUL (1610–60). A French realistic novelist and burlesque humorist, born in Paris. His well-to-do father was bigoted, his stepmother cruel. One induced him to take orders, the other cheated him of his inheritance. He was educated for the Church. He had a gay youth, was a welcome guest both of the aristocratic salons and of the less prim Marion Delorme and Ninon de l'Enclos. Then he was sent to Le Mans, was taken by his Bishop to Rome (1635), and made canon (1636). Symptoms of nervous disease now appeared and made him from 1638 till death a constant invalid and an intense sufferer. "My shins and thighs," he says, "first made an obtuse angle, then a right angle, and at last an acute one. My thighs and my body make another, and since my head bends over on my stomach, I am shaped quite like a Z." In this plight and having to earn his bread, Scarron was taken to Paris, and from 1645 to 1655 he wrote comedies and farces that made him for the moment the unquestioned leader in this field and also gave him intimate knowledge of the theatrical life of the time. Then in 1646 he refreshed his memories of provincial life at Le Mans and began to weave the comic aspects of province and stage into his *Roman comique* (1651–57), many episodes of which have both brilliancy and humor. Soon after the appearance of the first volume (1651) Scarron prepared to emigrate to America, but met Mademoiselle d'Aubigné, who had just returned thence empty of purse, but full of wit and beauty; mingled sentiment and pity led to their marriage (1652), and there was no more thought of America. Under the care of her who was to win the love of Louis XIV as Madame de Maintenon, Scarron lived eight years, editing a comic journal, writing dramas, a travesty of Vergil, *L'Enéide travestie* (1658), and eight remarkable *Nouvelles magi-comiques* (1659), which furnished models for Molière's Tartufe and Harpagon, a plot for his *École des femmes* and for Sedaine's *Gageure imprévue*, and a title for Beaumarchais's *Barbier de Séville*. Scarron's poetry and drama introduced Spanish and Italian burlesque into France. His fiction did the same, but it marked also an advance in natural character drawing and in the technique of rapid narration. The popularity of the *Roman comique* was immediate and perennial. It was repeatedly reprinted and many times continued, best by Offray. Good modern editions are by Fournel (Paris, 1857) and France (ib., 1881). Scarron's *Œuvres* were collected in 10 volumes (Paris, 1737) and in 2 volumes (ib., 1877), and the dramatic works in 1 volume (ib., 1879). There is a translation, *The Comical Works of Scarron*, with an introduction by Jusserand (London, 1892). Consult: Paul Morillot, *Scarron et le genre burlesque* (Paris, 1888); Le Breton, *Le roman au XVIIème siècle* (ib., 1890); Heinrich Körting, *Geschichte des französischen Romans im XVII. Jahrhundert* (Oppeln, 1891); Peters, *Scarron und seine spanischen Quellen* (Erlangen, 1893).

SCARTAZZINI, skär'tȧ-tsē'nē, JOHANN ANDREAS (1837–1901). A Swiss clergyman and Dante scholar, born at Bondo (Grisons). He edited Tasso (2d ed., 1882) and Petrarch (1883), but his great work, of compilatory character, embraces: *Dante Alighieri* (1869; 2d ed., 1879); edition of the *Divina Commedia* (1874–82); *Abhandlungen über Dante* (1880); *Dante in Germania* (1880–83); *Dante, vita ed opere* (1883; 1894 under the title *Dantologiæ*); *Prolegomeni* (1890); *Dante-Handbuch* (1892); edition of the *Commedia* (1893; 2d ed., 1895); *Enciclopedia Dantesca* (1896–98); *Dante als Geisteshold* (1896); *Concordanza della Divina Commedia* (1901).

SCAUP (from Icel. *skālp-hæna*, scaup duck). Any of several ducks of the Northern Hemisphere, of the same genus (*Aythya*) as that of the canvasback and redhead and having similar habits. The typical scaup is that of the Old World (*Aythya*, or *Marila*, *marila*), represented in North America and there commonly called bluebill, broadbill, or blackhead. It is 18 inches or more in length. The male has the head, neck, and upper part of the breast and back black; the sides of the neck glossed with rich green; the back white, spotted and striped with black lines; the speculum white. The female has brown instead of black, and old females have a broad white band around the base of the bill. The flesh of the scaup duck is tough and has a strong fishy flavor.

BILL OF A SCAUP.

Closely allied, but smaller, is the lesser scaup, or little bluebill, etc. (*Aythya*, or *Marila*, *affinis*), which has the head glossed with purple instead of green. A third species is the ring-necked duck, or moonbill (*Aythya*, or *Marila*, *collaris*), in which the brown of the fore parts is interrupted by a pale band about the neck. All these breed in the north, but are abundant in the spring and fall throughout the United States on the larger bodies of fresh water, as well as along the coast.

SCEATT, skăt, or **SCEATTA**, skăt'tȧ. A small coin, usually of silver, but sometimes of gold, used in Britain during the seventh century, the earliest type of coin known there after those of the Roman occupation.

SCENES OF CLERICAL LIFE. A group of stories by George Eliot (1858), originally published in *Blackwood's Magazine*, her first attempts in fiction.

SCENIC AND HISTORIC PRESERVATION SOCIETY, American. A national organization for the protection of American scenery and the preservation of American landmarks, incorporated by the New York State Legislature in 1895. Among its activities since then may be mentioned the following: it procured the purchase of the New York State park at Stony Point and of Washington's Headquarters in New York City, the creation of a State reservation at Watkins Glen, laws for the protection of Niagara Falls, acquired the site of Major André's execution, and has charge of Letchworth Park, Fort Brewerton, and Philipse Manor Hall.

SCENT GLANDS (from OF., Fr. *sentir*, to feel, perceive, smell, from Lat. *sentire*, to perceive by the senses; connected with Goth. *sinps*, journey, OHG. *sinnan*, to strive after, Ger. *sinnen*, to perceive). A large and diversified group of glands found in many animals, generally opening into the terminal portion of the intestine near the anus. The secretion of these glands is nearly always repulsive (to man, at least) and in some cases, as, notably, that of the skunk, is employed as a means of defense. The term is more strictly applied to the glands occurring in many carnivora and rodents, which consist of follicles that empty their secretion into small sacs with muscular walls and narrow orifices, placed one on each side of the anus. The civet cat has an anal sac on each side of the vent, as well as two other sacs opening by a common outlet in front of the vent. From the latter sacs is excreted the substance known as civet (see Civet), which is employed in the composition of perfumes. In the beaver analogous glands are found in both sexes near the genital orifices, in the form of large pyriform sacs, called preputial glands, which furnish the castoreum of commerce. See Musk.

SCEPTRE (Lat. *sceptrum*, from Gk. *σκῆπτρον*, *skēptron*, staff, from *σκήπτειν*, *skēptein*, to prop, to throw; connected with Skt. *kṣip*, to throw). A staff of some precious material, serving from time immemorial as the most notable symbol of royalty. The sceptre was in early times a truncheon pierced with gold or silver studs. Ovid speaks of it as enriched with gems and made of precious metals or ivory. The sceptre of the kings of Rome, which was afterward borne by the consuls, was of ivory and surmounted by an eagle. Some sceptres are surmounted by a cross, by a hand in the act of benediction, or by some suitable royal emblem, such as the fleur-de-lis of France. The sceptre of the English monarch is cruciform in appearance and dates from the days of Charles II.

SCHACK, shȧk, Adolf Friedrich, Count (1815–94). A German poet and critic, born near Schwerin. He studied law and entered the service of the Grand Duke of Mecklenburg. After traveling in the Orient, Schack studied Sanskrit, Arabic, and Persian in Berlin. In 1855 he settled in Munich and collected pictures for the gallery bearing his name, later willed to the German Emperor, and by the latter in turn given to the city. More scholar and critic than poet, Schack was at his best in his translations, especially the *Spanisches Theater* (1845), *Firdusi* (1865), *Strophen des Omar Chijam* (1878), *Orient und Occident* (1890), and *Englische Dramatiker* (1893). His original verse includes *Gedichte* (1867; 6th ed., 1888), *Nächte des Orients* (1874), the romance *Ebenbürtig* (1876), and *Lustspiele* (1891). As a critic his work was distinctly excellent, his chief titles being *Geschichte der dramatischen Litteratur und Kunst in Spanien* (1845–55), *Poesie und Kunst der Araber in Spanien und Sizilien* (1865; 2d ed., 1877), and the historical works *Die Normannen in Sizilien* (1889) and *Mazzini und die italienische Freiheit* (1891). Schack's autobiography appeared in 1887 under the title *Ein halbes Jahrhundert* (3d ed., Stuttgart, 1894), his collected works, in 10 volumes, in 1897–99 (3d ed.), and his posthumous poetry, edited by Winkler, in 1896. Consult the sketches by Rogge (Berlin, 1883), Brenning (Bremen, 1885), and Berg (Frankfort, 1896); L. Berg. *Zwischen zwei Jahrhunderten* (Frankfort, 1896).

SCHADOW, shä'dō, Friedrich Wilhelm (1789–1862). A German historical and religious painter, the virtual founder of the old Düsseldorf school. He was born in Berlin, Sept. 6, 1789, the son of Johann Gottfried Schadow, studied painting under Weitsch, and in 1810 proceeded to Rome, where he joined the Nazarites (see Pre-Raphaelites) and became a convert to Catholicism. His part in their joint frescoes in the Casa Bartholdi (now in the National Gallery, Berlin) was "Jacob with Joseph's Coat" and "Joseph in Prison." These are the most important works of his Roman period, although his Madonnas and portraits show a greater technical skill, upon the basis of which he was called in 1819 to be professor in the Berlin Academy. His principal work at Berlin was a large "Bacchanal," upon the ceiling of the Royal Theatre. He became director of the Düsseldorf Academy and entirely and beneficially reorganized the instruction there. Unlike his predecessor Cornelius, he practiced oil painting rather than fresco, placing greater weight upon color. He favored the historical and the religious picture and was much opposed to the genre and landscape afterward practiced by his pupils. His principal production during this period was "The Wise and the Foolish Virgins" (1837, Städel Institute, Frankfort); among other religious paintings are the "Four Evangelists" (Werdersche Kirche, Berlin) and "Christ and his Disciples at Emmaus" (National Gallery, ib.). In 1840 he went to Italy, whence he returned more austere in religion and uncompromising in advocating purely religious painting. His latest works include "Heavenly and Earthly Love," "Piety and Vanity in their Relation to Religion," and allegorical representations of "Heaven," "Purgatory," and "Hell," after Dante. He died at Düsseldorf. As an author he is known by his lecture, *Ueber den Einfluss des Christentums auf die bildende Kunst* (Düsseldorf, 1843), and the biographical sketches, *Der moderne Vasari* (Berlin, 1854). Consult Hübner, *Schadow und seine Schule* (Bonn, 1869), and the authorities referred to under Düsseldorf School of Painting.

SCHADOW, Johann Gottfried (1764–1850). A German sculptor. Born in Berlin, May 20, 1764, the son of a tailor, he became the pupil of Tassaert in 1776 and simultaneously studied drawing at the Academy. At Florence he was

powerfully impressed by the works of Giovanni da Bologna and Michelangelo, yet more deeply still in Rome by the antique sculptures. His acquaintance with Canova was especially instructive. In 1786 he won a first prize with a terracotta group, "Andromeda Delivered by Perseus," and upon his return to Berlin was elected a member and one of the four rectors of the Academy and appointed court sculptor in 1788. Schadow's most important works date from the next two decades, and in their unpretending simplicity give the full impression of life and individual truth. Among the most important are the Monument of Count von der Mark (1789–91), in the Dorotheenstadt Church, Berlin; a number of reliefs of antique subjects, in the various state rooms of the Royal Palace; the statue of Frederick the Great (1793), at Stettin, that of Ziethen (1894) and that of Prince Leopold of Anhalt-Dessau (1800), both at Gross-Lichterfelde (replicas in bronze, Wilhelmsplatz, Berlin). For the Brandenburg Gate he modeled the "Quadriga of Victory" (1789–94), the statue of Mars (1794), and the 16 metopes of the "Combat between the Centaurs and Lapithæ" (1794). Of his success in rendering female grace and beauty the group of "Crown Princess Louise and her Sister" (1795–97, Royal Palace, Berlin) is sufficient proof. A fine specimen of his treatment of the nude form is the life-size reclining figure of a woman (1797), long designated erroneously as the "Nymph Salmacis" by Thorvaldsen. Intimate characterization distinguishes a bronze group of "Frederick the Great with his Greyhounds" (1816), at Sans-Souci. Schadow concluded his monumental plastic work with the statues of Blücher (1819), at Rostock, and Luther (1821), at Wittenberg, and his last piece in marble was the statuette of a "Girl Reposing" (1826), in the National Gallery, Berlin. Since 1792 he had also fashioned about 100 portrait busts of the Hohenzollern and other prominent personages, among them those for the Walhalla, near Regensburg, including Frederick the Great, Charlemagne, Henry the Fowler, Copernicus, Kant, Wieland, and others, and that of Goethe (1816), in the National Gallery. His numerous drawings rank with the best of his time, more than 1000 being preserved at the Berlin Academy. He published a number of works on art subjects, important in his day, but now antiquated. His chief importance consists in his independence from the then prevailing classical tendency and in the foundation thereby laid for the later development of realistic sculpture in Germany. From 1816 to his death, Jan. 28, 1850, he was director of the Berlin Academy, highly gifted and successful as a teacher. See, for one son, SCHADOW, FRIEDRICH WILHELM. Another son and pupil, RUDOLPH (1786–1822), born in Rome, returned thither from Berlin in 1811 and under the influence of Thorvaldsen followed the lines of classicism. Consult the monograph by Friedländer (Düsseldorf, 1864), and Eggers, in Dohme, *Kunst und Künstler* (Leipzig, 1886).

SCHAFAŘÍK, shä'fär-zhêk, PAVEL JOSEF. See ŠAFAŘÍK.

SCHÄFER, shā'fēr, DIETRICH (1845–). A German historian, born at Bremen and educated at Jena, Heidelberg, and Göttingen. He was appointed professor at Jena (1877), Breslau (1885), Tübingen (1888), and Heidelberg (1896) and was called to Berlin in 1903. He became known as a versatile and prolific writer of scholarly and readable books. His earlier works deal with Denmark and with the Hanse. During his residence at Tübingen he inaugurated the justly celebrated *Württembergische Geschichtsquellen* (vols. i–iii). His championship of the supremacy of political history as against the claims of *Kulturgeschichte* involved him in a notable joust with Gothein (1888–91). The trend of his later interests is shown by his *Deutschland zur See* (1897), *Deutsche Hanse* (1903), *Kolonialgeschäfte* (3d ed., 1910), and two good general works, *Deutsche Geschichte* (3d ed., 1913) and *Weltgeschichte der Neuzeit* (6th ed., 1913)—the last a remarkable achievement for one man in these days of coöperative histories. Consult: E. Bernheim, *Lehrbuch der historischen Methode* (6th ed., Leipzig, 1908); G. Wolf, *Einführung in das Studium der neueren Geschichte* (Berlin, 1910); E. Fueter, *Geschichte der neueren Historiographie* (Munich, 1911); G. P. Gooch, *History and Historians in the Nineteenth Century* (London, 1913).

SCHÄFER, SIR EDWARD ALBERT (1850–). An English physiologist, born in London and educated in University College. He became assistant professor of physiology in 1874 and was Jodrell professor from 1883 to 1899, when he was named professor of physiology in Edinburgh. In 1912 he was president of the British Medical Association, and the next year he was knighted. He introduced suprarenal extract into medicine. Besides valuable papers on muscular structure, on the chemistry of blood proteids, on absorption, and on the rhythm of voluntary contraction, he wrote *A Course of Practical Histology* (1877), *Essentials of Histology* (1885; 6th ed., 1902), *Advanced Text-Book of Physiology by British Physiologists* (1898), *Experimental Physiology* (1910), and edited Quain's *Elements of Anatomy* (with G. D. Thane, 8th, 9th, and 10th editions).

SCHAFF, shäf, DAVID SCHLEY (1852–). An American Presbyterian theologian and editor, son of Philip Schaff. He was born at Mercersburg, Pa., and graduated from Yale in 1873. He held, after his ordination in 1877, three pastorates, served as professor of Church history at Lane Theological Seminary (1897–1903), and thereafter as professor of ecclesiastical history and history of doctrine at the Western Theological Seminary. In 1913 he was a delegate to the Pan-Presbyterian Council at Aberdeen, Scotland. He was coeditor of the *Schaff-Herzog Encyclopædia* (4 vols., 1883) and *History of the Christian Church* (vol. i, 1907; vol. ii, 1910), and author of *Commentary on Acts* (1882), *Life of Philip Schaff* (1897), *John Huss, his Life, Teachings, and Death* (1915), and a translation of Huss's *The Church* (1915).

SCHAFF, PHILIP (1819–93). An American Church historian. He was born at Chur, Switzerland, Jan. 1, 1819; studied at Stuttgart, Tübingen, Halle, and Berlin; traveled in 1841 as private tutor in France, Switzerland, and Italy; and returned to Berlin as privatdocent in theology (1842–44). On invitation from the German Reformed church he came to America in 1844 and became professor of theology in the German Reformed Theological Seminary at Mercersburg, Pa. In 1864 he removed to New York City. In 1870 he became connected with Union Theological Seminary, holding, successively, several chairs, and was finally professor of Church history (1887–93) there. His most important works are his *History of the Christian Church*

(1858–90), his translation, adaptation, and editing of Lange's *Commentary on the Holy Scriptures* (1864–86), *The Schaff-Herzog Encyclopædia of Religious Knowledge* (3 vols., 1884; reëdited, 13 vols., 1911), his collecting and introducing of *The Creeds of Christendom* (1877–84), and his editing of the *Nicene and Post-Nicene Fathers*. His deepest desire was for the union of Christendom. He was one of the founders of the American branch of the Evangelical Alliance and founded the American Society of Church History (1888). Consult his *Life* by his son, D. S. Schaff (New York, 1897), which contains a bibliography.

SCHAFFHAUSEN, shâf-hou'zen. The northernmost canton of Switzerland (Map: Switzerland, C 1). Area, 114 square miles. The canton forms a part of the Rhine valley. In the northern part are mountainous spurs from Baden. Numerous streams flow towards the Rhine and render even the higher portions of the region cultivable. The products include cereals, vegetables, and wine, and domestic animals of Swabian and Swiss breeds are raised. The manufacturing industries are centred at Schaffhausen (q.v.), the capital. Schaffhausen is one of the most democratic cantons of Switzerland. Its constitution, dating from 1876 and modified in 1895, provides for a legislative assembly (Grosser Rat) elected for four years, at the rate of one member for every 500 inhabitants, and an elected executive council of five members. The initiative and obligatory referendum are in force. Schaffhausen sends two representatives to the Federal Council. Pop., 1910, 45,943, principally German-speaking Protestants.

SCHAFFHAUSEN. The capital of the canton of the same name in Switzerland, situated on the Rhine at an altitude of 1295 feet, about 25 miles north of Zurich (Map: Switzerland, C 1). The town is quaint and contains many gabled houses dating from the sixteenth and the seventeenth centuries. There are an interesting early Romanesque basilica dating from the eleventh century, the seventeenth-century town hall, the museum with the town library, and the Imthurneum, containing a theatre, a picture gallery, a concert hall, etc. Above the town rises the massive sixteenth-century tower of Munot, with its fine terrace, and at the western end of the town lies the Fäsenstau Promenade. Schaffhausen is connected by two bridges with the village of Feuerthalen on the opposite bank of the Rhine. The manufactures are of wide range, including various iron and steel products, scientific instruments, machinery, watches, yarns, textiles, pottery, etc. Pop., 1900, 15,400; 1910, 15,957, mostly Protestants. Schaffhausen is mentioned as a city in the twelfth century and soon after became a free city of the Empire. It joined the Swiss Confederation in 1501. Two miles below Schaffhausen are the famous Falls of the Rhine, one of the grand scenic features of central Europe. In three leaps over the rough ledge the river here descends nearly 100 feet.

SCHÄFFLE, shĕf'le, Albert (1831–1903). A German economist and sociologist. He studied theology at Tübingen, and from 1850 to 1860 he edited the *Schwäbischer Merkur* at Stuttgart. Professor of political economy at the University of Tübingen (1860–68), he subsequently became a professor at the University of Vienna. From February until October of 1871 he was Austrian Minister of Commerce. Upon the overthrow of the ministry he went to Stuttgart, where he devoted himself to literary work. Among his best-known publications are *Die Quintessenz des Sozialismus* (1874) and *Die Aussichtslosigkeit der Sozialdemokratie* (1885). His *Bau und Leben des sozialen Körpers* (1875–78; new ed., 1896) undertakes to construct a thoroughgoing sociological system. His other important works are *Die Nationalökonomie* (1861), a third edition of which appeared in 1873 under the title *Das gesellschaftliche System der menschlichen Wirtschaft*, and *Kapitalismus und Sozialismus* (1870).

SCHAFHÄUTL, shâf'hoi-t'l, Karl Emil von (1803–90). A German geologist and physicist, whose early writings on acoustics and on the preparation of steel and iron were under a pseudonym, the Latinized equivalent of his name, Pellisov. He was born in Ingolstadt, studied mathematics and mineralogy at Landshut and English methods of puddling and forging iron at Sheffield, and in 1843 became professor of geology, mineralogy, and mining in Munich, where, six years afterward, he was appointed librarian of the university. His most important work was the introduction into Bavaria of what he had learned at Sheffield. Schafhäutl devised many mathematical and physical instruments, of which his areometer, photometer, and phonometer are most valuable. Besides his publications on geology and physics, which appeared in English and German technical reviews, he wrote on the history of music, to which he especially devoted himself in his later years.

SCHALCKEN, shâlk'en, Godfried (1643–1706). A Dutch genre painter, born in Made. He received his art training at Dordrecht under Hoogstraten and in the studio of Gerard Dou at Leyden. In 1692 and again in 1699 he visited England, where he enjoyed great popularity, painting many important people of the day, including William III, a portrait of whom is now in The Hague Museum (another copy in Amsterdam). He lived for a time (1703) under the patronage of the Elector Palatine in Düsseldorf, executing many pictures there. But, excepting this and a few other portraits and some historical, mythological, and landscape studies, Schalcken produced small canvases with artificial light effects. His masterpiece is a scene from *Vrouwtje kom ten Hoof* (Buckingham Palace); other good examples are: "Old Woman Scouring a Pan" and "Soldier Giving Money to a Woman" (London National Gallery); "Ceres Seeking Proserpine" and "Old Man Writing" (Louvre); "Girl Blowing Out Taper" (Munich); "Girl Reading Letter" (Dresden Gallery); "The Boy Angling" (Kaiser Friedrich Museum, Berlin); "Toilet by Candle" (The Hague)—all with wonderfully mellow treatment and warm coloring, though sometimes with forced light effects. His sister, Maria, and his nephew, Jacob (1684–1722), were his pupils and painted so much in Godfried's manner that their work is often confused with his. Consult DeGroot, *Catalogue of Dutch Painters* (New York, 1913).

SCHALKE, shäl'ke. Formerly a commune of the Rhine Province, Prussia, with important coal mines, iron and steel works, machine shops, coke ovens, tin-plate works, chemical factories, glass and mirror works. In 1903 it was joined with Gelsenkirchen (q.v.). Pop., 1900, 26,077.

SCHALL, shâl, Johann Adam von (1591–1666). A Jesuit missionary to China. He was born of noble family at Cologne, entered the Society of Jesus in 1611, and went as a missionary to China in 1628. He succeeded not only in

forming a flourishing mission, but was ultimately invited (1630) to the Imperial court at Peking, where he was intrusted with the compilation of the calendar and the direction of the public mathematical school, being himself created a mandarin. Through this favor with the Emperor Schall obtained an edict which authorized the building of Roman Catholic churches and the liberty of preaching throughout the Empire, and in 14 years the Jesuit missionaries in the several provinces are said to have received into the Church 100,000 proselytes. On the death of this Emperor (1661), however, a change of policy fatal to the prospects of Christianity took place. Schall was thrown into prison and sentenced to death, and although released in 1665, he had suffered so much that he died soon after. For a portrait of him in the costume of a mandarin, see illustration under COSTUME, ECCLESIASTICAL. Consult Platzweg, *Lebensbilder deutscher Jesuiten in auswärtigen Missionen* (Paderborn, 1882).

SCHAMYL. See SHAMYL.

SCHANDORPH, shän'dôrp (properly **SKAMDRUP**), SOPHUS (CHRISTIAN FREDERIK) (1836–1901). A Danish poet and novelist, who excelled in portraying the life of the Danish middle and lower classes. Born and educated in Ringsted, he studied first theology and then the Romance languages and gained the doctorate at Copenhagen University in 1874. He possessed a keen sense of humor and remarkable powers of observation. One of his best novels is *Smaafolk* (1880), the story of a peasant girl beset by the temptations of a large city. His other works include: *Uden Midtpunkt* (1878); *Thomas Friis' Historie* (2 vols., 1881); *Skovfogedbörnene* (1884); *Det gamle Apothek* (1885); *Fra Isle de France og fra Sorö Amt* (1888); *Stillelius Folk* (1892). A complete edition of his novels appeared in 1903–06. Consult his memoirs, *Oplevelser* (Copenhagen, 1889–98).

SCHANZ, shänts, GEORG VON (1853–). A German economist, born in Grossbardorf and educated in Munich, Würzburg, and Strassburg. He was employed in the Statistical Bureau in Munich, became assistant professor at Erlangen in 1880, and in 1882 was called to the chair of economics in Würzburg. In 1884 he became editor of the *Finanzarchiv*, and it is with finance and the history of commerce that his works especially deal. He wrote: *Geschichte der deutschen Gesellenverbände* (1877); *Englische Handelspolitik gegen Ende des Mittelalters* (1881); *Die Steuern der Schweiz* (1890); *Beiträge zur Frage der Arbeitslosenversicherung* (1895–1902); *Der künstliche Seeweg und seine Bedeutung* (1904).

SCHANZ, MARTIN VON (1842–). A German classical scholar, born at Uechtelhausen in Bavaria. In 1875 he became professor of classical philology in the University of Würzburg. His studies were chiefly directed to Plato, historical Greek syntax, and the history of Roman literature. His most important published works are: *Beiträge zur vorsokratischen Philosophie* (1867); *Studium zur Geschichte des Platonischen Textes* (1874); *Platonis Opera* (1st critical ed., 1874); and numerous editions of separate dialogues. After 1882 he edited *Beiträge zur historischen Syntax der griechischen Sprache.* His *Geschichte der römischen Litteratur* (4 vols.: vols. i–ii in 3d ed., 1907–13; vol. iii, 2d ed., 1905; vol. iv, part i, 2d ed., 1914), which constitutes part viii of I. Müller's *Handbuch der klassischen Altertumswissenschaft,* is important for its comprehensive survey of every field, its objectivity and impartiality, and the excellence of its characterizations, and constitutes the best available general history of Latin literature.

SCHAPER, shä'pēr, FRITZ (1841–). A German sculptor, born at Alsleben, Prussian Saxony. He was first a stone mason, then studied at the Berlin Academy and under Albert Wolff. An instructor at the Academy in 1875–90, he was elected a member in 1880. His masterpiece is the beautiful Goethe Monument in Berlin (1880). Among his other monumental works are the statues of Bismarck (1879) and Moltke (1881), both at Cologne, of Krupp (1889, Essen) and Luther (1890, Erfurt); the equestrian statue of William I (1901, Aix-la-Chapelle); an heroic-size "Victory" (1885, Arsenal, Berlin); and the statue of the Great Elector (1901, Sieges Allee, Berlin). He is also known for his busts. Although his work is always refined and pleasing, his conceptions are often commonplace.

SCHARF, shärf, JOHN THOMAS (1843–98). An American antiquary and historian, born in Baltimore, Md. He served in both the Confederate army and navy, was several times wounded, and once narrowly escaped being put to death as a spy. Later he engaged in journalism and in Baltimore was at different times editor of the *Evening News, Sunday Telegram,* and *Morning Herald.* He devoted much attention to history and made a collection of many thousands of documents, pamphlets, and other historical material, which he gave in 1891 to Johns Hopkins University. His publications include: *Chronicles of Baltimore* (1874); *History of Maryland* (3 vols., 1879–80); *History of Baltimore City and County* (1881); *History of Western Maryland* (2 vols., 1882); *History of Philadelphia* (3 vols., 1884); *History of the Confederate States Navy* (1887); *History of Delaware* (1888).

SCHARNHORST, shärn'hôrst, GERHARD JOHANN DAVID VON (1755–1813). A Prussian general, founder of the modern Prussian military system. He was born in Hanover. He entered the military service of his native state in 1778, was teacher in the artillery school of Hanover about 1780, and was engaged in the campaigns in Flanders in 1793–95. In 1801 he was called into the Prussian service and became director of the Prussian military school. He served in the field in the disastrous campaigns of 1806–07 and was then made president of the commission charged with the reorganization of the Prussian army and head of the War Department. Working in harmony with the other regenerators who came to Prussia in her need, he accomplished this in spite of the distrust and opposition of the old-time Prussians. Universal service was not secured until his death, but he laid down the principles for its adoption. Enrollment of foreigners was abolished, corporal punishment was limited to flagrant cases of insubordination, promotion for merit was established, and the military administration organized and simplified. The organization of the Landwehr, or reserve, was begun. So promptly were the results of this work seen that the Prussian army, which had been so ineffective before Tilsit, was able to play an important part in the final campaigns against Napoleon, Scharnhorst was wounded in the battle at Grossgörschen, May 2, 1813, and died at Prague, June 28. He was the author of several works on military affairs. Consult his biography by Klippel (3 vols., Leipzig, 1869–71),

which is devoted especially to his reforms and their results.

SCHARWENKA, shär-vĕn'kä, PHILIPP (1847–). A German pianist and composer, born in Samter, Posen. He was educated at the Posen Gymnasium and in 1865 was enrolled as a pupil of the Kullak Neue Akademie der Tonkunst in Berlin, where he was a special pupil of Würst and H. Dorn. In 1870–81 he taught theory and composition at the academy and then took up a similar position at the conservatory of his brother Xaver (q.v.). His compositions include many charming numbers for orchestra, pianoforte, violin, cello, and voice; the choral works *Herbstfeier*, Op. 44, and *Sakuntala*, for solo and orchestra; two symphonies; *Arkadische Suite;* a symphonic poem, *Frühlingswogen;* and a festival overture, *Dörfer-Tanzweise*, for chorus and pianoforte.

SCHARWENKA, XAVER (1850–). A German composer and pianist, born at Samter. He was educated at Kullak's Academy in Berlin under Kullak and Würst. In 1874 he began a series of very successful tours throughout Europe and America, and in 1881 he established a conservatory in Berlin, where his brother Philipp (q.v.) was associated with him. Ten years later he removed to New York City and became director of the Scharwenka Conservatory there. His Berlin school meanwhile amalgamated with that of Karl Klindworth, and in 1898 he returned to Germany and assumed charge of the Klindworth-Scharwenka Conservatory, which he conducted till 1914, when he withdrew and opened a new Meisterschule. His works include the opera *Mataswintha* (1896), a symphony in C minor, three concertos for piano and orchestra, and considerable chamber and pianoforte music.

SCHÄSSBURG, shĕs'bŭrk (Hung. *Segesvár*). A royal free city and the capital of the County of Gross-Kokel (Nagy-Küküllö), Hungary, on the Great Kokel, 80 miles by rail northwest of Kronstadt (Map: Hungary, J 3). The town has a Protestant Gymnasium, with a free library and museum, and a Roman Catholic normal school. It is noted as the scene of the defeat of the Hungarian army by the Russians, July 31, 1849, the celebrated poet Petöfi (q.v.) being among the Hungarian dead. Pop., 1900, 10,857; 1910, 11,550.

SCHAUDINN, shou'dĭn, FRITZ (1871–1906). A German zoölogist and discoverer of the cause of syphilis. He was born at Röseningken, East Prussia, studied at the University of Berlin, where he became lecturer in 1898, and in the following year participated in Römer's expedition to Spitzbergen. As a result of this experience he compiled *Fauna Arctica* (1900). In 1900 he was called to the Imperial Hygienic Institute in Berlin and then sent to the zoölogical station in Ravigno. Two years after his return to Berlin in 1904 he became a member of the Institute for Tropical Diseases at Hamburg. From 1892 to 1896 he paid special attention to the protozoa and after 1896 to pathogenic protozoa. He isolated several new species of protozoa and bacteria, especially, in 1905, with Erich Hoffmann, the *Spirochæta pallida*, the bacillus of syphilis. He put forward a new theory on the generation of protozoa, established the difference between the entamœba of Lösch and the *Entamœba histolytica*, demonstrated the life cycle in trypanosoma and spirochæta, and investigated malaria and amœbic dysentery, adding much to our knowledge of these diseases.

SCHÄUFELEIN, shoi'fe-līn, HANS LEONHARD (c.1480–1540). A German painter, designer, and wood engraver. He was born in Nuremberg, probably studied under Wolgemut, and then became the assistant of Dürer, whom he imitated. In 1512 he went to Augsburg and in 1515 removed to Nordlingen. Schäufelein is a graceful narrator, and his types, though rarely accurately drawn, are attractive, but he lacks power and depth. Characteristic early paintings are the altarpiece at Ober-St. Veit, near Vienna (1502), "Scenes from the Life of Christ" (Dresden Gallery), and "St. Jerome" (Germanic Museum, Nuremberg). To his Nordlingen period belong his masterpiece, the so-called "Ziegler Altar" for St. George's Church (1521), part of which is still in the church, part in the museum; "Scenes from the Story of Judith," in the town hall; and the illuminated Psalter for Count von Ottingen, now in the Berlin print room. His most important woodcuts are those for the *Theuerdank* of Emperor Maximilian.

SCHAUFFLER, shouf'lĕr, WILLIAM GOTTLIEB (1798–1883). A Protestant missionary in Turkey. He was born at Stuttgart, Germany. After a brief visit to Turkey he came to America in 1826 and after four years of study at Andover was ordained in 1831 and sent by the American Board to Paris to study Arabic and Persian with De Sacy and Turkish with Professor Kieffer. He went to Constantinople and preached in German, Italian, French, Spanish, Turkish, and English. By appointment of the British and Foreign and American Bible societies he devoted himself to the translation of the Bible into the Turkish language. He published an ancient Spanish version of the Old Testament, revised by himself, with the Hebrew original, in parallel columns, a grammar of the Hebrew language in Spanish, and a Hebrew and Chaldee lexicon of the Old Testament in the same language; also *Meditations on the Last Days of Christ*, discourses delivered in Constantinople (1837). He returned to America in 1877 and died in New York City. Consult his *Autobiography* (New York, 1887).

SCHAUMBURG-LIPPE, shoum'bŭrk-lĭp'pe. A principality and constituent state of the German Empire, covering an area of 131 square miles (Map: Germany, C 2). Its surface is somewhat mountainous in the north and well wooded. Agriculture and gardening are pursued actively in the south, and coal is mined in the east. The chief manufacture is linen. The principality is represented by one member in the Bundesrat and returns one deputy to the Reichstag. Pop., 1900, 43,132; 1910, 46,656, almost exclusively Protestants. Capital, Lippe. The ruling dynasty was founded in 1640 by a cadet of the Lippe family, who inherited the County of Schaumburg. The state was created a principality in 1807 and joined the North German Confederation in 1866 and the German Empire in 1871.

SCHECHTER, shĕk'tĕr, SOLOMON (1847–1915). A Jewish scholar and educator. He was born at Fokshani, Rumania, and studied at Vienna and later at Berlin. Under the patronage of the Montefiore family he went to England, where his literary studies began. In 1892 he became reader in Rabbinic at Cambridge University. In 1894 he visited America to lecture at Gratz College, Philadelphia, upon "Some Aspects of Jewish Theology." His discovery in 1896 of a page of the Jewish original of Ecclesiasticus (q.v.) led to a visit to Cairo to examine

the Geniza (or store chamber for disused books) of the Jewish synagogue, and he brought back the whole collection (80,000 pieces), which he presented to Cambridge. From this university he received the degree of Litt.D. and the office of curator of Oriental literature. At University College, London, he was appointed professor of Hebrew in 1899. In 1901 the Jewish Theological Seminary of America was reorganized and endowed on condition of Dr. Schechter's becoming its president; he accepted the offer and came to New York in 1902. Harvard University gave him its degree of Litt.D. in 1911. His best-known work is *The Wisdom of Ben-Sira* (1899), the fruits of the Geniza fragments, published with Dr. C. Taylor. Other important works are: *Abot de Rabbi Nathan* (1887); *Studies in Judaism* (1st series, 1896); *Midrash-Ha-gadol*, vol. i (1902); *Saadyana* (1902); *Studies in Judaism* (2d series, 1908); *Some Aspects of Rabbinic Theology* (1909); *Documents of Jewish Sectaries* (2 vols., 1911).

SCHEEL, shāl, Fritz (1852–1907). A German-American orchestral conductor, born at Lübeck. He received his first instruction from his father, the conductor of the local orchestra. In 1864–69 he was a pupil of Ferdinand David at Leipzig. In 1870 he began his career as concert master in Bremerhaven and three years later went in a similar capacity to Schwerin. In 1880–90 he was municipal conductor in Chemnitz. At the World's Fair in Chicago he directed the Trocadero Orchestra. In 1894 he organized a symphony orchestra in San Francisco, which he led for four seasons. When the Philadelphia Symphony Orchestra was founded in 1900, he was appointed its conductor, and it was not long before this organization was recognized as one of the great orchestras in the United States. Scheel died in Philadelphia.

SCHEELE, shā'le, Carl Wilhelm (1742–86). A Swedish chemist, born at Stralsund. In 1770 he settled in Upsala and carried on investigations in chemical analysis which resulted in important discoveries. In 1775 he removed to Köping. The chief of his discoveries were tartaric acid (1770), chlorine (1774), baryta (1774), oxygen (1774, independently of Priestley), and glycerin (1784). In experimenting on arsenic he discovered the arsenite of copper, which is known as a pigment under the name of Scheele's green. In 1782 he succeeded in isolating hydrocyanic (prussic) acid. The mode and results of his various investigations were communicated from time to time, in the form of memoirs, to the Academy of Stockholm, of which he was an associate. A complete edition of his works, *Sämmtliche Werke*, was published by Hermbstadt (Berlin, 1793). Consult: Hays, *The Life Work of Carl Wilhelm Scheele* (New York, 1884); Cap, *Scheele, chimiste suédois* (Paris, 1863); Thorpe, "Scheele," in *Nature* for 1892; N. A. E. Nordenskiöld, *Nachgelassene Briefe und Aufzeichnungen von Carl Wilhelm Scheele* (Stockholm, 1892; in Swedish, 1892).

SCHÉELE, Knut Henning Gezelius von (1838–). A Swedish Lutheran theologian, born in Stockholm and educated at Upsala. There he gained the degree of Ph.D. (1863), and became docent (1867) and professor (1879). In 1885 he was made Bishop of Visby. In 1893, on the tercentenary of the Upsala decree, he was the King's representative to the United States and in 1901 represented his university and nation at the Yale Bicentennial. He visited the United States again (1912) and donated his library to the Augustana Lutheran College at Rock Island, Ill. His works on theological symbolics (1885) and on the Church Catechism (1886) were published in German versions.

SCHEELITE, shēl'īt (named in honor of Carl Scheele, who first discovered tungstic acid in the mineral). A mineral calcium tungstate crystallized in the tetragonal system. It has a vitreous lustre and runs in color from white, through yellow, to red and green. It occurs with crystalline rocks, tin ores, and various tungsten minerals and is found in Bohemia, Saxony, the Tirol, Hungary, Chile, and in the United States at various localities in Connecticut, North Carolina, Nevada, and Colorado. It finds some use in the manufacture of tungstic acid, especially as the metal tungsten is being more and more employed in the manufacture of steel.

SCHÉFER, shā'fâr', Charles Henri Auguste (1820–98). A French diplomat and Orientalist, born in Paris and educated at the Ecole des Langues Orientales. He entered the Foreign Office and served as dragoman in Jerusalem, Smyrna, Alexandria, and Constantinople. In 1857 he became professor of Persian in Paris, succeeding Quatremère, and 10 years afterward became president of his alma mater, whence he was transferred to the Collège de France in 1868. Schéfer edited many Persian texts and a Persian chrestomathy (2 vols., 1883–85) and edited and translated into French a great mass of material bearing on the history of Central Asia, the most important of which was included in the *Recueil de voyages et de documents pour servir à l'histoire de la géographie* (1882–97), with Cordier. Other works of note are his edition of Abd al Karim Buhari's history of Central Asia (1876), edition of Nasir i Khusrau's *Sefer Nameh* (1881), and *Siasset-Nameh, traité du gouvernement par le vizir Nizam-oul Moulk* (1891–97). His collection of Oriental manuscripts is in the Bibliothèque Nationale. Consult Bouché-Leclerq, *Notice sur la vie et les travaux de Charles Schéfer* (Paris, 1899).

SCHEFF, shĕf, Fritzi (1880–). An American actress and vocalist, born in Vienna, Austria. She studied at Hoch's Conservatoire at Frankfort and made her début at Munich in the title rôle of *Martha* (1898). In 1901 she first appeared at the Metropolitan Opera House, New York, singing parts in *La Bohème, Die Meistersinger, Die Walküre,* and *Don Giovanni.* She sang in the opera *Babette* at Washington and New York (1903), had an immense success as Fifi in *Mlle. Modiste* (1905–08 and 1913), and appeared also in *The Prima Donna* (1908), *The Mikado* (1910), *The Duchess* (1911), and *The Love Wager* (1912). Later she sang in vaudeville. She married, first, Baron Fritz von Bardeleben, then John Fox, Jr., and, in 1912, John Anderson, an actor.

SCHEFFEL, shĕf'el, Joseph Viktor von (1826–86). A German poet and novelist, born at Karlsruhe, Feb. 16, 1826. He studied law, philology, and literature at Heidelberg, Munich, and Berlin; served judicially at Säckingen (1850) and Bruchsal (1852); traveled in Italy, Switzerland, and France; and from 1857 to 1859 was librarian at Donaueschingen. In 1864 he settled permanently at Karlsruhe. His first book, *Der Trompeter von Säckingen* (Stuttgart, 1853; 280th ed., 1907), was written at Capri and Sorrento in 1853 and is the most popular German epic of the century; it is half

playful, half melancholy, wholly romantic, and full of sly humor. His historical novel *Ekkehard* (Frankfurt, 1855; 225th ed., 1908), written at Saint-Gall and Heidelberg (1854–55) and based on systematic investigation, is a blending of history and poetry, vivid and faithfully picturesque. Soon afterward he published *Gaudeamus*, a collection of student songs. His later poems, tales, and novels, *Frau Aventiure* (1863), *Juniperus* (1881), *Der Heini von Steier* and *Hugideo* (1884), never attained the popularity of his earlier works. His collected works were edited by Proelss (6 vols., Stuttgart, 1907). Consult Proelss, *Scheffels Leben und Dichten* (Berlin, 1887).

SCHEF'FER, *Fr. pron.* shĕf'fâr', Ary (1795–1858). A French historical painter of the Romantic school. He was born at Dordrecht, Holland, studied drawing at Lille, and in 1811 went to Paris, where, in the studio of Guérin, he had Géricault and Delacroix for fellow students and with them defied the ultraclassical teachings of Guérin. He preserved his connection with the new Romantic movement in the expression of sentiment, but in execution he aimed more for purity of form, thus becoming an eclectic. The three classes of subjects affected by him serve in a general way to divide his life into three periods. His attention was first attracted to scenes from real life, in the depiction of which he showed his sympathy with suffering, like "The Soldier's Widow" (1821); "Death of Géricault" (1824), now in the Louvre; "Orphans at the Tomb of their Mother" (1824); "The Suliote Women" (1827). His second period shows him absorbed in ideal scenes drawn from the works of Goethe and Schiller, Byron and Dante. Among these are "Count Eberhard," in the Louvre; the "Submission of Wittekind" and the "Battle of Zülpich," in the Versailles Museum. In 1830 he painted the first of his series dealing with Marguerite. To this subject he frequently returned, the final one of the series, "Marguerite at the Fountain," being painted in 1858. The third period, characterized by his religious subjects, is not distinctly marked off from the second, for he began the religious pictures with the "Christus Consolator" (1837), now in the Museum Fodor, Amsterdam. After 1840 he was largely occupied with religious themes and reached his highest achievement in "Christ Weeping over Jerusalem," "Christ Tempted of Satan," and the "Christ of the Reed." There is a Scheffer Museum containing many of his portraits and other material at Dordrecht. The taste of recent years has deprived Scheffer of the high place he once occupied when the illustrative qualities of art were more in favor. Consult the monographs by Mrs. Grote (London, 1860) and Hofstede der Groot (Berlin, 1870); im Thurn (Nîmes, 1876); Vitet, *Ary Scheffer Album* (Berlin, 1861).

SCHEF'FLER, Johann. A German poet. See Angelus Silesius.

SCHEHERAZADE, shĕ-hā'râ-zā'dĕ. In the *Arabian Nights*, the wife of Schahriar, Sultan of India, to whom she relates a story each night for a thousand and one nights and by exciting his interest escapes the usual fate of his wives.

SCHEIDT, shīt, Samuel (1587–1654). A famous German organist and composer, born at Halle. He was a pupil of Sweelinck at Amsterdam. In 1609 he became organist at St. Moritz and musical director to the Margrave Christian Wilhelm at Halle. He was the first to develop the Protestant chorale into the instrumental Choralvorspiel, an art which found its highest development in the similar works of Bach. His principal work is the *Tabulatura Nova*, containing a mass, psalms, toccatas, chorales, etc. Other works are: *Tabulaturbuch 100 geistlicher Lieder und Psalmen; Cantiones Sacræ; Concerti Sacri; Ludi Musici; Liebliche Kraftblümlein; Neue geistliche Konzerte.*

SCHEIN, shīn, Johann Hermann (1586–1630). A German composer and organist, born at Grünhain (Saxony). In 1615 he was kapellmeister at Weimar, and the following year he was appointed cantor at St. Thomas's in Leipzig, where he remained till his death. His works comprise *Venus-Kräntzlein oder neue weltliche Lieder; Cymbalum Sionium sive Cantiones Sacræ; Banchetto musicale; Musica divina; Musica boscareccia.* His best-known work is *Cantional oder Gesangbuch augsburgischer Konfession.* A complete edition of his works, edited by A. Prüfer, was begun in 1902 by Breitkopf and Härtel.

SCHEINER, shī'nĕr, Christoph (1573–1650). A German astronomer, born at Waldo in Swabia. At various times he was professor of mathematics at Dillingen, Ingolstadt, Innsbruck, Rome, and Vienna, and rector of the Jesuit College at Neisse. In 1611 Scheiner discovered the existence of sun spots. His friend Marcus Welser, of Augsburg, to whom he reported his observations, published the letters under an assumed name as *Apelles Latens post Tabulam* (1612). In the same year appeared, under Scheiner's own name, *Tres Epistulæ de Maculis Solaribus.* Both works aroused the enmity of Galileo, who claimed to be the first to have discovered sun spots. Scheiner further provoked Galileo by upholding the old thesis of a "stable" earth and a "mobile" sun. His great work on the sun, containing the results of about 2000 observations (made with an equatorial telescope of the type now called Sisson's), was the *Rosa Ursina* (1630). Scheiner invented a helioscope and a pantograph.

SCHEINER, Julius (1858–1913). A German astronomer, born in Cologne and educated at Bonn. He became assistant at the astrophysical observatory in Potsdam in 1887 and its observer in chief in 1898, three years after his appointment to the chair of astrophysics in the University of Berlin. Scheiner paid special attention to celestial photography and wrote *Die Spektralanalyse der Gestirne* (1890); *Lehrbuch der Photographie der Gestirne* (1897); *Strahlung und Temperatur der Sonne* (1899); *Der Bau des Weltalls* (1901; 3d ed., 1909). In 1899 he began the publication of the *Photographische Himmelskarte, Zone + 31° bis + 40° Deklination.*

SCHEINPFLUG, shīn'pflo͝ok, Paul (1875–). A German composer, born in Loschwitz, near Dresden. From 1890 to 1894 he was a pupil of the Dresden Conservatory. In 1898 he became concert master of the Philharmonic Society of Bremen and the next year conductor of the Musikverein at Königsberg. His compositions include a *Frühlingssymphonie*, an *Ouverture zu einem Lustspiel*, a piano quartet in E♭, a violin sonata in F, *Weihnachtslied der Engel* for female chorus and organ, male choruses, and songs.

SCHELDT, skĕlt (Dutch *Schelde*, Fr. *Escaut*). A river of Belgium. It rises in France in the Department of Aisne and flows first north

into Belgium, then northeast to Antwerp, below which city it empties into the large, branching estuary which merges with the Rhine delta and opens by several wide channels into the North Sea through southwestern Holland (Map: Belgium, C 3). Its total length is 267 miles, and it is navigable by skillful arrangement of locks 210 miles, while below Antwerp it is accessible especially by way of Flushing and the Wester Scheldt to the largest ships. A system of canals connects it with the chief cities of Belgium and north France. The Dutch monopolized the navigation of the Wester Scheldt and levied a toll on foreign vessels until the river was made free by the Treaty of Brussels in 1863.

SCHELLENDORFF, Bronsart von. See Bronsart von Schellendorff.

SCHELLING, shĕl'lĭng, Ernest (1876–). An American pianist and composer, born at Belvedere, N. J. Displayed as a prodigy at four and a half, his later career, contrary to many precedents, justified expectations. From 1882 to 1885 he studied in Paris with George Mathias and Moszkowski, and after that with Leschetizky. For four years, from 1898 to 1902, he was a pupil of Paderewski. After 1903 he made extensive tours of Europe and of North and South America. In 1913 he was elected to the National Institute of Arts and Letters. As a composer he became known through his *Suite Phantastique* for piano and orchestra, *Légende Symphonique*, a symphony, a *Ballet Divertissement*, a sonata for piano and violin, piano pieces, and a set of variations for piano and orchestra.

SCHELLING, Felix Emanuel (1858–). An American English scholar. He was educated at the University of Pennsylvania (A.B., 1881; LL.B., 1883; A.M., 1884), where he became professor of English literature in 1893 and from which he received honorary degrees of Litt.D. and LL.D. He was elected to membership in the American Institute of Arts and Letters. Schelling edited various Elizabethan plays and wrote: *Literary and Verse Criticism of the Reign of Elizabeth* (1891); *Life and Works of George Gascoigne* (1893); *A Book of Elizabethan Lyrics* (1896); *A Book of Seventeenth Century Lyrics* (1899); *The English Chronicle Play* (1902); *The Queen's Progress and Other Elizabethan Sketches* (1904); *History of Elizabethan Drama* (1908); *English Literature during the Life Time of Shakespeare* (1910); "The Restoration Drama" (1912), in *Cambridge History of English Literature; The English Lyric* (1913); *A History of English Drama* (1914).

SCHELLING, Friedrich Wilhelm Joseph von (1775–1854). A German philosopher. He was the son of a country clergyman and was born at Leonberg in Württemberg. He studied at Tübingen and Leipzig and in 1798 was called to be professor extraordinarius in Jena. Here he found himself in a remarkable social and literary circle, comprising among others the brothers Schlegel with their wives and Tieck, Steffens, and Novalis. With Goethe, too, he was on good terms, while Schiller's philosophical views repelled him. Schelling's philosophical tendencies had been originally determined by Fichte; in fact, he was at first an enthusiastic advocate of the Fichtean idealism, and his earliest writings, *Ueber die Möglichkeit einer Form der Philosophie überhaupt* (1795) and *Vom Ich als Princip der Philosophie* (1795), were composed in this spirit. Gradually, however, Schelling diverged from his master, who came to seem to him one-sided. The first result of his departure from Fichte's view was the once famous *Identitätsphilosophie*, which attempted to show that subject and object, the ideal and the real, are completely undifferentiated in the absolute, and that in nature there is a preponderance of the objective, while in consciousness there is a preponderance of the subjective. The philosophy of identity reminds one of Spinozism (see Spinoza) in maintaining a featureless ground of all existence. It differs from Spinozism in regarding the subjectives and the objectives as everywhere present together in the phenomenal world, but with varying preponderance of the two elements. The principal works in which this view is more or less completely developed are: *Ideen zu einer Philosophie der Natur* (1797); *Von der Weltseele* (1798); *Erster Entwurf eines Systems der Naturphilosophie* (1799); *System des transcendentalen Idealismus* (1800). In 1803 he was called to Würzburg as professor of philosophy. Here his views underwent another change. He gave up the philosophy of identity, and began to champion a mystical view, according to which all finitude is the result of a fall from the absolute—a fall the effects of which the course of history has to repair. This theory is first broached in *Philosophie und Religion* (1804). In his later works, *Philosophische Untersuchungen über das Wesen der menschlichen Freiheit* (1809), *Denkmal der Schrift Jacobis von den göttlichen Dingen* (1812), and *Ueber die Gottheiten von Samothrake* (1815), he became more and more theosophical. He was now strongly under the influence of Bruno (q.v.) and Böhme (q.v.) and maintained that within the absolute there is a dark irrational ground, which gradually becomes clarified, thus giving development to the idea of God. Meanwhile, in 1806, he had gone to Munich as member of the Academy of Arts. From 1820 to 1826 he lectured at Erlangen. In 1827 he was elected professor at the newly established University of Munich, and 14 years later he went to Berlin as member of the Academy of Science. This position carried with it the privilege of lecturing in the University of Berlin. Between 1815 and 1842 Schelling published only two minor productions. This was due to the fact that a most formidable adversary to him had arisen in his old college friend Hegel (q.v.), who, though older, had at first been an ardent disciple of Schelling's. During the reign of Hegel in the world of German philosophy Schelling preserved a silence which was not broken till 1834, three years after Hegel's death; then he wrote a preface to Becker's translation of one of Cousin's writings. In this preface he criticized Hegel's views as being too exclusively idealistic and as giving no recognition to the empirical side of reality. He died at the baths of Ragatz in Switzerland, Aug. 20, 1854.

Bibliography. Schelling's complete works in 14 volumes were published by his son K. F. A. Schelling (Stuttgart and Augsburg, 1856–61). The second part contains his Berlin lectures. Selections in 3 volumes, edited by Weiss, appeared in 1907 (Leipzig). A translation of a portion of his *System of Transcendental Philosophy* is given in Rand's *Modern Classical Philosophers* (1908). For Schelling's life, consult G. L. Plitt (ed.), *Aus Schellings Leben in*

Briefen (3 vols., Leipzig, 1869–70). Kuno Fischer, in *Geschichte der neuern Philosophie*, vol. vii (3d ed., Heidelberg, 1902), gives a full biography in addition to an account of his philosophy; also Hebert Beckers, *Schelling's Geistesentwicklung in ihrem innern Zusammenbung* (Munich, 1873–74); Ludwig Noack, *Schelling und die Philosophie der Romantik* (new ed., 2 vols., Berlin, 1879–80); Andrew Seth, *The Development from Kant to Hegel* (London, 1882); Koeber, *Die Grundprincipien der Schellingschen Naturphilosophie* (Berlin, 1882); Groos, *Die reine Vernunftwissenschaft* (Heidelberg, 1889); Hartmann, *Schelling's philosophisches System* (Leipzig, 1897); Erwin Kircher, *Philosophie der Romantik* (Jena, 1906); Braun, "Schelling," in Aster's *Grosse Denker* (Leipzig, 1911); also the histories of philosophy by Ueberweg-Heinze, Höffding, Windelband, and Bergmann.

SCHEM, shĕm, Alexander Jacob (1826–81). An American statistician. He was born in Wiedenbrück, Prussia, and, after studying at the universities of Bonn and Tübingen, edited Westphalian newspapers until 1851, when he came to the United States. Here he was engaged as professor of Hebrew and modern languages at Dickinson College (1854–60), but resigned in 1860 to devote himself to literature. From 1874 until his death he was assistant superintendent of schools in New York. He edited statistical almanacs for 1860 and 1868–69, published a *Latin-English School Lexicon* (1857), with Rev. George R. Crooks, and a *Cyclopædia of Education* (1877), with Henry Kiddle, and was one of the editors of the *Methodist* and of the *Methodist Quarterly Review*. He edited the *Deutsch-Amerikanisches Conversations-Lexicon* (12 vols.).

SCHEMNITZ, shĕm'nĭts (Hung. *Selmeczbánya*). A royal free city and the capital of the County of Hont, Hungary, in a narrow mountain gorge, 66 miles north of Budapest (Map: Hungary, F 2). There are six suburbs. The academy for mining and woodcraft, embracing collections of minerals and a chemical laboratory, is the chief architectural feature. There are a ruined castle and a Piarist seminary. Cigars and shoes are manufactured. Schemnitz is famous for its mines, which extend under the town, and produce gold and silver, as well as copper, iron, and sulphur. It was made a free royal city in the twelfth century. Pop., 1900, 16,370; 1910, 15,165.

SCHENCK, skĕnk, Robert Cumming (1809–90). An American soldier, political leader, and diplomat, born at Franklin, Ohio. He graduated at Miami University in 1827, later studied law, was admitted to the bar in 1831, and practiced his profession at Dayton. He was a member of the State Legislature in 1841–42, and a Whig member of Congress in 1843–51. In 1851–53 he was Minister to Brazil. While in South America he negotiated treaties between the United States and the Argentine Republic, Uruguay, and Paraguay. Upon the outbreak of the Civil War he was appointed a brigadier general of volunteers. In 1861 he aided in clearing the mountains of West Virginia of Confederates, and the next spring he commanded the Federal right wing at Cross Keys. At the second battle of Bull Run he led his troops with the utmost gallantry and was severely wounded. He was then promoted to the rank of major general of volunteers, but resigned his commission in 1863. He was a member of Congress from 1863 to 1870 and was successively chairman of the Committee on Military Affairs and chairman of the Committee on Ways and Means. In 1871 he was a member of the Joint High Commission which drew up the Treaty of Washington and was Minister to England from 1871 to 1876, when he resigned in consequence of accusations made against him in connection with the Emma Silver Mine fraud. Subsequent investigations cleared him of all suspicion of complicity. He resumed the practice of law in Washington, D. C.

SCHENECTADY, skĕ-nĕk'tă-dĭ. A city and the county seat of Schenectady Co., N. Y., situated 17 miles northwest of Albany, on the Mohawk River, the State Barge Canal, and on the New York Central and Hudson River and the Delaware and Hudson railroads, and traction lines to Albany, Troy, Johnstown, Fonda, Gloversville, and Saratoga Springs (Map: New York, G 5). Standing on the site of the principal village of the old Mohawk tribe, it is splendidly situated at an elevation of 230 feet above the sea and occupies an area of almost 8 miles. In the residential district are the grounds and buildings of Union College, a part of Union University, opened in 1795 (q.v.). There are 32,000 volumes in the public library. A well-kept system of parks, comprising some 230 acres, is maintained by the city. Among the finest structures are the courthouse, city hall, Van Curler Opera House, county courthouse and jail, Ellis Hospital, and Mercy Hospital. There are 24 school buildings, costing more than $2,000,000 and including a handsome high school, which cost $560,000. Other noteworthy features are the Old Ladies' Home, sanatorium, Children's Home, Federal Building, Y. M. C. A., Y. W. C. A., the Day Nursery, and Indian Monument, standing at the foot of Ferry and Front streets, marking the place where the Great Massacre took place.

Schenectady has, in recent years, achieved considerable importance as a manufacturing centre. In the census year 1909 a capital of $51,816,000 was invested in its 134 industrial establishments, giving employment to 17,728 persons and yielding a product valued at $38,165,000. Here are the homes of the well-known General Electrical Company, employing almost 20,000 persons, whose buildings cover some 350 acres and whose manufactures include general electrical apparatus, motors and supplies, and electrical implements, and of the American Locomotive Works. Other industrial plants are foundries and machine shops, bottling works, and manufactories of clothing, knives, insulators, display frames, patent medicines, brooms, brushes, etc. The government is vested in a mayor, chosen biennially, a unicameral council, and in various administrative officials. For maintenance and operation the city spent, in 1914, $1,995,000, the principal items being: schools, $488,000; water works, $155,000; municipal lighting, $61,000; fire department, $118,000; streets, $133,000; police, $116,000. The water works, which are owned by the municipality, represent an outlay of $1,800,000. The city's total bonded indebtedness in 1913 amounted to $4,811,970, while its assessed valuation for real and personal property was $56,828,899. There are 63 miles of well-paved streets, 109 miles of sewers, and 100 miles of

water mains. Pop., 1890, 19,902; 1900, 31,683; 1910, 72,826, of whom 18,631 were foreign born; 1915 (State census), 80,386; 1920, 88,723.

The site of Schenectady was visited in the middle of the seventeenth century by Scotch and Dutch pioneers. In 1662 Arendt van Curler made the first permanent settlement on the site of the great Mohawk "Castle" and capital of the Five Nations, Schonowe. On Feb. 8, 1690, the French and Indians massacred 60 and captured between 80 and 90 of its 250 inhabitants and destroyed 60 of its 66 houses. In 1748 another massacre occurred in its immediate vicinity. Gradually the place was rebuilt, soon becoming the point of river traffic to the West, by canoe and batteau. It also figured prominently in the Revolutionary War and in the War of 1812. There are many places of historic interest here and several fine specimens of Dutch Colonial and early American architecture. Schenectady became a city in 1798. In 1819 a large part of the town was destroyed by fire. Consult: Howell and Munsell, *History of Schenectady County* (Albany, 1886); L. P. Powell (ed.), in *Historic Towns in the Middle States* (New York, 1899); G. S. Roberts, *Old Schenectady* (Schenectady, 1904); Miller and Haff, *Atlas of Schenectady* (Philadelphia, 1906).

SCHENK, shĕnk, AUGUST (1815–91). A German botanist and geologist, born at Hallein and educated at Munich, Erlangen, Vienna, and Berlin. After being docent in Munich and professor in Würzburg he was from 1868 to 1887 professor at Leipzig. On prehistoric flora Schenk was one of the greatest of German authorities. He wrote *Beiträge zur Flora der Vorwelt* (1863); *Beiträge zur Flora des Keupers und der rätischen Formation* (1864); *Fossile Flora der Grenzschichten des Keupers und Lias Frankens* (1865–67); and in Richthofen's *China* (1882) a summary of the flora from the anthracite and Jurassic formations. He was one of the editors of the *Handbuch der Botanik* (1879–90).

SCHENK, JOHANN (1753–1836). An Austrian composer, born at Wiener-Neustadt. In 1778 he composed a mass, which became popular throughout Germany, and in 1785 his first operetta, *Die Weinlese*, was produced at Vienna. This was followed by nearly a dozen others of similar character, of which the most important was *Der Dorfbarbier* (1796).

SCHENK, LEOPOLD (1840–1902). An Austrian embryologist, born at Urmeny, Comitat Neatra, Hungary. At Vienna, where he graduated M.D. in 1865, he was appointed assistant professor of embryology in 1873. Schenk became well known through his theory regarding determination of sex in the embryo, published in *Einfluss auf das Geschlechtsverhältniss des Menschen und der Thiere* (1898; Eng. trans., *The Determination of Sex*, 1898). As a result of 30 years of careful observation of the generative process, he came to the conclusion that the sex of the child depends upon the kind of nourishment given to the mother; moreover, he decided that in this way even the characteristics of the future child may be influenced, so as to overcome the possibility of degeneration. This theory was severely criticized by leading medical men, and its author was finally forced to resign from his academic post. Besides the treatise mentioned he is author of several textbooks (*Lehrbücher*): *der vergleichenden Embryologie der Wirbelthiere* (1874); *der Histologie des Menschen* (1885; 2d ed., 1892); *der Bakteriologie* (1894); *der Embryologie* (1896).

SCHENKEL, shĕnk'el, DANIEL (1813–85). A Protestant Swiss theologian, born at Dägerlen in the Canton of Zurich. After studying at Basel and Göttingen he lectured and taught at Basel in 1838–41 and returned there in 1850 as professor and member of the Church Council, having in the meanwhile officiated as first parish priest at Schaffhausen. In 1851 he became professor, director of the seminary, and university chaplain at Heidelberg. Of his numerous writings the following partake essentially of the character of mediatory theology: *Das Wesen des Protestantismus* (1845–51), supplemented with *Das Prinzip des Protestantismus* (1852); *Gespräche über Protestantismus und Katholicismus* (1853); *Der Unionsberuf des evangelischen Protestantismus* (1855); *Die Reformatoren und die Reformation* (1856). A transition to liberal doctrines distinguishes *Die christliche Dogmatik vom Standpunkt des Gewissens* (1858–59). In 1863 he participated in the foundation of and presided over the German-Protestant Union, whose principles were elucidated in his *Christentum und Kirche im Einklang mit der Kulturentwicklung* (1867–72) and in *Der deutsche Protestantenverein und seine Bedeutung in der Gegenwart* (1868). Much hostility was excited by his *Charakterbild Jesu* (1864; 4th ed., 1873). His subsequent publications include: *Friedrich Schleiermacher* (1868); *Luther in Worms und in Wittenberg* (1870); *Das Christusbild der Apostel und der nach-apostolischen Zeit* (1879). He also edited the *Bibellexikon* (5 vols., Leipzig, 1869–75).

SCHENKENDORF, shĕnk'en-dôrf, MAX VON (1783–1817). A German poet, born in Tilsit and educated at Königsberg. During the War of Liberation, in which he took an active part, Schenkendorf was associated with Arndt and Körner in the writing of patriotic songs. His poems were published as *Gedichte* (1815), *Poetischer Nachlass* (1832), and *Sämtliche Gedichte* (1837; 5th ed., 1878). For his *Life*, consult Hagen (Berlin, 1863); Knaake (Tilsit, 1890); E. von Klien, *M. von Schenkendorf* (Vienna, 1908).

SCHERER, shā'rār', EDMOND HENRI ADOLPHE (1815–89). A French theologian and literary critic. He was born in Paris, studied theology in England and Strassburg, and in 1845 was appointed professor of exegesis at Geneva. Owing to the changes in his religious convictions, he resigned his professorship in 1850 and in 1860 he moved to Versailles, where he headed a liberal movement in the French Protestant church. After the establishment of the Republic he was elected in 1871 a member of the National Assembly and in 1875 a life Senator. His publications include: *Mélanges de critique religieuse* (1860); *Mélanges d'histoire religieuse* (1864); *Etudes critiques sur la littérature contemporaine* (1863–95), of which George Saintsbury translated *Essays on English Literature* (London, 1891); biographies of Alexander Vinet (1853), Diderot (1880), and Melchior Grimm (1887). Consult his *Life* by V. C. O. Gréard (Paris, 1890); E. Lagoz, *Essai sur E. Scherer, théologien* (Lausanne, 1891); E. G. Boutmy, *Taine, Scherer, Laboulaye* (Paris, 1901).

SCHERER, shā'rĕr, WILHELM (1841–86). A German critic and literary historian. He was

born in Schönborn (Lower Austria), studied at Vienna and Berlin, and, after holding professorships at Vienna and Strassburg, was in 1877 appointed professor of the history of modern German literature at Berlin. In 1874 he had founded at Strassburg with Ten Brink the valuable series, *Quellen und Forschungen zur Sprach- und Kulturgeschichte der germanischen Völker*. Scherer's great work was the *Geschichte der deutschen Litteratur* (1883; 12th ed., 1912; Eng. trans., *History of German Literature*, 1886), which is marked by scientific method, by grasp of the development of national literature, and by clarity of style. Besides, he wrote: *Zur Geschichte der deutschen Sprache* (1868); *Deutsche Studien*, on the eleventh and twelfth centuries (1870–78; 2d ed., 1891); a *Geschichte der deutschen Dichtung* in the same period (1875); *Anfänge des deutschen Prosaromans* (1877); *Aus Goethes Frühzeit* (1879); *Jakob Grimm* (2d ed., 1885). From his posthumous papers were published: *Aufsätze über Goethe* (1886; 2d ed., 1900); *Poetik* (1888); *Kleine Schriften* (2 vols., 1893, ed. by Burdach and E. Schmidt).

SCHERMAN, shâr'mân, Lucian (1864–). A German Orientalist, born at Posen. He was educated at the universities of Breslau and Munich, with which latter he was connected after 1885, becoming professor extraordinary of Sanskrit in 1901. He wrote: *Philosophische Hymnen aus der Rig- und Atharva-Veda-Sanhitâ* (1887); *Materialien zur Geschichte der indischen Visionslitteratur* (1892); *Zur centralasiat-indischen Archäologie* (1903). In 1894 he became the editor of the *Orientalische Bibliographie*.

SCHERR, shĕr, Johannes (1817–86). A German literary critic, born at Hohenrechberg, Swabia, and educated at the universities of Zurich and Tübingen. In the revolution of 1848 he took so prominent a part that he was forced to flee to Switzerland. After 1860 he taught in the Zurich Polytechnic. He wrote some purely humorous sketches, a few novels, of which the most popular was *Michel, Geschichte eines Deutschen unserer Zeit* (1858; 10th ed., 1905); a series of literary and cultural histories and essays, notably *Allgemeine Geschichte der Litteratur* (1851; 10th ed., 1900); *Deutsche Kultur- und Sittengeschichte* (1852; 11th ed., 1902); *Geschichte der englischen Litteratur* (1854; 3d ed., 1883); *Geschichte der deutschen Frauenwelt* (5th ed., 1898); biographies of Schiller (1859; last ed., 1900) and of Blücher (1862; 4th ed., 1887). Part of his tales appeared as *Novellenbuch* in 10 volumes (Leipzig, 1873–77). German critics compare him to Carlyle, because of his vivid style, his vehement bias, and his biting wit.

SCHERZER, shĕr'tsĕr, Karl von (1821–1903). An Austrian traveler and author. He was born at Vienna, became a printer, studied languages at Vienna, and in 1852–55, with Moritz Wagner, visited the United States, Central America, and the West Indies. In 1857–59 he accompanied the Novara expedition around the world. On his return he was knighted and in 1866 was made ministerial counselor in the Department of Commerce. In 1869 he accompanied the Austrian expedition to eastern Asia and in 1872 entered the diplomatic service, becoming Consul General in Smyrna. In 1875 he was transferred to London, in 1878 to Leipzig, and in 1884 to Genoa, retiring in 1896. In 1899 he visited Buenos Aires. He was an acute observer and wrote many volumes, among the more important being *Reisen in Nordamerika* (1854; 2d ed., 1857), with Wagner; *Wanderungen durch die mittelamerikanischen Freistaaten* (1857); *Reise der österreichischen Fregatte Novara um die Erde* (1861–62, and statistical section, 1864); *Fachmännische Berichte über die österreichisch-ungarische Expedition nach Siam, China und Japan* (1872); *Smyrna* (1873); *Das wirtschaftliche Leben der Völker* (1885).

SCHERZO, skĕr'tsō (It., jest, sport). In music, a term applied to an instrumental composition of a lively, piquant character, admitting sudden and violent contrasts of dynamic shading. The term was originally used as a direction mark for performers. In the modern sonata or symphony, however, the scherzo is an essential movement. It was first introduced by Beethoven, who greatly extended the form and gave it its special character, in his *Second Symphony*, where it takes the place of the minuet in the symphonies of Haydn and Mozart. Even in Haydn's time the minuet in the symphony had lost its original stately character, and Beethoven's first scherzo is more like the minuet than the form which he perfected later in the *Eroica*. Schumann, in the first and second of his symphonies, becomes an innovator through the introduction of *two* trios instead of the usual *one*. Chopin's *Scherzo* is really a misnomer and has nothing to do with the accepted form. See Chopin.

SCHEURER-KESTNER, shoi'rĕr-kĕst'nĕr, *Fr. pron.* shẽ'râr' kĕst'nâr', Auguste (1833–99). A French chemist and politician. He was born at Mülhausen, Alsace, and studied chemistry in Paris. Becoming interested in the efforts to improve the condition of the workingman he founded for that purpose, in 1865, a coöperative society. He was elected a representative from the Upper Rhine in the National Assembly in 1871, and in 1875 was elected to the Senate, of which he became Vice President in 1896. In 1879 he succeeded Gambetta as director of the journal *La République Française*. During the Dreyfus excitement he was conspicuous among those who believed in the prisoner's innocence, and he testified at Zola's trial. In addition to several scientific monographs he published *Principes élémentaires de la théorie chimique des types appliqués aux combinaisons organiques* (1862).

SCHEVENINGEN, skā'ven-ĭng-en. A noted bathing resort in South Holland, the Netherlands, on the coast, about 2 miles northwest of The Hague, with which it is incorporated and connected by a fine shaded allée, a canal, and an electric road (Map: Netherlands, C 2). It has a fine Kurhaus and is visited annually by over 20,000 guests. Here, in 1653, the English gained a great naval victory over the Dutch under M. Tromp, who was killed, and here De Ruyter, in 1673, defeated the combined fleets of England and France. Pop., 1913, 22,-143.

SCHIAPARELLI, skē'à-pà-rĕl'lē, Giovanni (1835–1910). An Italian astronomer, born at Savigliano in Piedmont. He studied in Turin, in Berlin under Encke, and at Pulkova under W. Struve. In 1859 he returned to Italy and became second astronomer at the Milan Observatory and in 1862 its director, continuing in that position until 1900, when he retired. In

1861 he discovered the planetoid Hesperia (69). In 1877 he discovered certain markings on the surface of Mars, the so-called canals. (See MARS.) He also announced that he has been able to observe markings on the surface of Mercury and to fix the period of its axial rotation as the same as that of its sidereal rotation. This, however, has not yet been sufficiently confirmed by other astronomers. (See MERCURY.) He wrote: *I precursori di Copernici nell' antichita* (Milan, 1873); *Le sfere omocentriche di Eudosso, di Callippo e di Aristotele* (ib., 1875); *Osservazioni astronomiche e fisiche sull' asse di rotazione e sulla topografia del pianeta Marte* (6 parts, Rome, 1878–99); *L'Astronomia nell' Antico Testamento* (Milan, 1903; Eng. trans., Oxford, 1905).

SCHIAVONE, skyä-vō'nâ, ANDREA (c.1522–82). The appellation of Andrea Meldolla (Medolla, or Medula), an Italian landscape and historical painter and engraver. He was born at Sebenico (Dalmatia) and went early to Venice and worked as a house decorator. He thus came under the notice of Titian, whose studio he entered and by whom he was strongly influenced. Giorgione, Parmigianino, and Tintoretto also left their mark upon his style. Indifferent in design, he succeeded to a marked degree in acquiring the Venetian color. He was one of the first painters of landscape for its own sake. Among his paintings are a "Pietà" and a "Holy Family," both in the Dresden Gallery; "The Adoration of the Shepherds," Uffizi and Vienna galleries; two landscapes in the Berlin Gallery; and ceiling paintings in the Royal Palace, Venice.

SCHICHAU, shĭK'ou, FERDINAND (1814–96). A German engineer, born at Elbing. He studied in Berlin and in England and in 1837 founded at Elbing his machine shop, which developed finally into a great foundry for making locomotives, industrial machinery, and steel ships. He was the first to build a dredger in 1841 and also constructed the first Prussian screw vessel in 1855. Later he made a specialty of constructing torpedo boats and destroyers, supplying more than 300 of these vessels to Russia, Germany, Austria, Italy, and China. Schichau established a floating dock at Pillau in 1889, and in 1892 opened his great shipyard at Danzig, where for the most part the new German navy was later built and where were constructed great ocean liners for the North German Lloyd and Hamburg-American lines. Carl H. Ziese, Schichau's son-in-law, succeeded to the management.

SCHIEDAM, skē'däm'. A river port of South Holland, the Netherlands, at the confluence of the Schie with the Meuse, 3 miles west of Rotterdam (Map: Netherlands, C 3). The town is noted for its numerous distilleries of Holland gin, which is exported together with grain. Pop., 1900, 27,126; 1910, 32,039.

SCHIEFNER, shēf'nĕr, FRANZ ANTON VON (1817–79). A Russian Orientalist, born in Reval (Esthonia) and educated at St. Petersburg and Berlin. He was elected a member of the St. Petersburg Academy of Sciences in 1852 and was chosen librarian of that body in 1863. From 1860 to 1873 he was professor of classical languages in the Roman Catholic Theological Seminary of St. Petersburg. Among his studies on the languages of Central Asia the most important were on Tibetan literature, especially as a source for North Indian Buddhism. In 1868 he edited, and in 1869 translated into German, an edition of Taranatha's history of Buddhism. He also devoted himself to the Ural-Altaic and Siberian languages, translated the *Kalevala* (1852), and wrote on the Tush (1856), Udic (1863), Tchetchents (1864), and Kasikumutch (1866) dialects. He translated from Tibetan into German the *Bkah-hgyur*, a collection of tales, which were thence done into English by Ralston (London, 1882).

SCHIEMANN, shē'mân, THEODOR (1847–). A Russo-German historian, born in Grobin and educated at the universities of Dorpat and Göttingen. He taught in a secondary school in Livonia for eight years, was director of the Reval archives for four years, and in 1887 became docent at Berlin and in 1892 professor. Schiemann wrote excellent weekly summaries of politics and contemporary history for the Berlin *Kreuz-Zeitung*. Among his extremely valuable works on Russian history (besides contributions to the *Zeitschrift für ost-europäischen Geschichte*, which he edited after 1911) are *Russland, Poland, und Livland bis in xviii. Jahrhundert* (1886–87), in Oncken's *Allgemeine Geschichte*, and *Geschichte Russlands unter Nikolaus I.* (3 vols., 1904, 1908, 1913).

SCHIEVELBEIN, shē'fel-bīn, HERMANN (1817–67). A German sculptor. He was born in Berlin, where he studied at the Academy and under Wichman. He later went to St. Petersburg, where he was employed in decorating the Winter Palace and St. Isaac's Cathedral. "Pallas Instructing a Young Warrior," for the palace bridge, and numerous plastic works for the royal palaces and various public buildings bear witness to his activity on his return to Berlin, but his masterpiece was the grand frieze, more than 200 feet in length, depicting in a series of dramatic scenes the "Destruction of Pompeii and Herculaneum" (Greek court of the New Museum). Schievelbein was one of the best of Rauch's followers and faithfully adhered to the traditions of his school. See RAUCH.

SCHIFF, shĭf, JACOB HENRY (1847–1920). An American banker and publicist, born at Frankfort-on-the-Main, Germany. He came to the United States in 1865 and became a member of the banking firm of Kuhn, Loeb & Co. of New York City. Later he became a director of the Central Trust Company, of the Western Union Telegraph Company, and of the National City Bank of New York. At various times he served also as president of the Montefiore Home for Chronic Invalids, vice president and trustee of the Baron de Hirsch Fund, director of the New York Foundation of the National Employment Exchange, and vice president of the New York Chamber of Commerce. Schiff founded the Jewish Theological Seminary in New York, the Semitic Museum at Harvard, and the Nurses' Settlement of New York and gave $100,000 for a Technical College at Hafia, Palestine. Greatly interested in civic reform, he was a leading member of the "Committee of 70," which effected the overthrow of the Tweed Ring, and later a member also of the "Committee of 15" and the "Committee of 9," all organizations for the reform of New York City politics.

SCHIFF, MORIZ (1823–96). A German biologist, born at Frankfort-on-the-Main. He studied at Heidelberg, Berlin, and Göttingen (M.D., 1844) and was appointed chief of the ornitho-

logical department of the zoölogical museum of his native city. Because he had taken an active part in the Baden revolution in 1849 as surgeon to the revolutionary army under Tiedemann he was not able to secure a university position in Göttingen and went to Bern, Switzerland, where he was appointed professor of comparative anatomy at the university in 1854. In 1863 he was called to Florence as professor of physiology at the high school and in 1876 to the same chair at the University of Geneva. Schiff was one of the leading biologists of the nineteenth century, although in later years he paid more attention to physiology, especially the physiology of the nervous system. He made important observations on the thyroid, showing that by the injection of thyroid extract the fatal issue after an extirpation of the thyroid may be avoided. He also contributed much to the study of diabetes and the relation of the nervous system to its production.

SCHILDKRAUT, shĭlt'krout, RUDOLF (1862–). A German actor, born at Constantinople. He attended the Vienna Conservatory of Music and studied under Mitterwurzer (q.v.), but later chose the stage as his career. In 1893 he appeared at the newly opened Raimund Theater in Vienna and after 1898 attracted much attention by his work in comedy at the Karl Theater. At the Hamburg Playhouse, then also newly founded, he created a number of his more serious rôles, including several in Shakespearean dramas. Afterward, in Berlin, he played at the Reinhardt Theater and at the Apollo and in New York at the Irving Place Theatre and at a number of Yiddish theatres. He returned to Germany in 1913. A remarkably versatile actor, Schildkraut built up a repertoire both varied and extensive, including Shakespeare's Lear, Shylock, Richard III, King John, Othello, Falstaff, and Malvolio; Schiller's Philip of Spain (in *Don Carlos*) and Franz Moor (in *The Robbers*); and Lessing's Nathan the Wise. Among the modern authors he played Hauptmann and Sudermann, Shaw and Pinero, Oscar Wilde and others. He created the part of the Hunchback in *Sumurun*, while his interpretations of Shylock and Mephistopheles (in Reinhardt's production of Goethe's *Faust*) are considered masterpieces of histrionic art.

SCHILLER, shĭl'ẽr, FERDINAND CANNING SCOTT (1864–). An English philosopher. He was educated at Rugby and at Balliol College, Oxford, and studied also in Cornell University, where he was instructor of philosophy from 1893 to 1897. He was then made assistant tutor at Corpus Christi College, Oxford, where, after 1903, he was tutor and fellow. He became known as the leading English exponent of pragmatism (q.v.), which, however, he prefers to call humanism (q.v.). For him humanism is primarily a logical method, determined by "the perception that the philosophical problem concerns human beings striving to comprehend a world of human experience by the resources of human minds." What especially differentiates him from his American colleagues is his humanistic metaphysics, according to which even inanimate objects are regarded as being spiritual in nature. "They respond to our cognitive operations on the level on which they apprehend them. That they do not respond more intelligently, and so are condemned by us as 'inanimate,' is due to their spiritual remoteness from us, or perhaps to our inability to understand them, and the clumsiness and lack of insight of our manipulations, which afford them no opportunity to display their spiritual nature." He published: *Riddles of the Sphinx* (1891; 2d ed., 1910); "Axioms as Postulates," in *Personal Idealism* (1902); *Humanism* (1903; 2d ed., 1912); *Studies in Humanism* (1907; 2d ed., 1912); *Plato or Protagoras?* (1908); *Formal Logic, a Scientific and Social Problem* (1912), and many articles. Schiller became prominent in the Society for Psychical Research.

SCHILLER, JOHANN CHRISTOPH FRIEDRICH VON (1759–1805). A famous German poet and dramatist, born at Marbach, Württemberg, Nov. 10, 1759. Schiller's father was a military surgeon and captain; his mother an innkeeper's daughter, pious and of refined tastes. As a child he showed imagination and desired to become a clergyman, but the autocratic Duke Karl of Württemberg "gently kidnaped" him for his military academy (1773) against his will and his parents' desire. Here, under stern yet somewhat whimsical discipline, Schiller studied the humanities and laws, while reading, with omnivorous hunger, Shakespeare, Lessing, Klopstock, Goethe's *Werther*, and the sensational Storm and Stress (q.v.) dramas of Klinger and Leisewitz. Clandestinely he began to write, and when, in 1775, the school was moved to Stuttgart, he went over to the study of medicine. But he continued his poetic efforts and in 1777 set to work on *Die Räuber*, the first of his published plays, intended as an emphatic protest against the existing political conditions of which he had himself been a victim.

On graduating from the ducal school (Dec. 14, 1780) Schiller was forced to take service as regimental surgeon, galled alike by his functions and his dress. His rebellious mood was shown by a poem on the death of his friend Weckerlin, a bitter defiance of society and its conventional creed. *Die Räuber*, printed at his own expense (1781), made an immediate and deep impression. In a somewhat weakened form it was produced (Jan. 13, 1782) with great applause, though its style was somewhat rough and unpolished and some details of the plot unnatural. Its dramatic form, however, is surprisingly good. Schiller, who had gone surreptitiously to Mannheim for a second time (1781), to witness it, was sentenced to two weeks' arrest and forbidden to publish anything except medical treatises. He escaped from Württemberg (September, 1782) with a romantic friend, Streicher, and after some wandering remained in retirement for a few months with a generous patroness, Frau von Wolzogen, at Bauerbach. An historical drama, *Fiesko*, was nearly completed at the time of Schiller's escape. This he sold to the Mannheim publisher Schwan for 10 louis and began with fresh enthusiasm a third, *Luise Millerin*, later called *Kabale und Liebe*, on local political conditions, and a fourth on *Don Carlos*, son of Philip II of Spain, in whose tragic fate Schiller's letters show that he had been for some years interested. He also made love to his patroness' daughter, which induced the mother to help him to establish himself at Mannheim (July, 1783), where he had an offer of permanent engagement as dramaturgist, which, however, was canceled after a year. *Fiesko* was produced in January, 1784, and failed. It was a disguised political manifesto, more radical and democratic than the Mannheim public could appreciate, and it

lacked intrinsic value; but it is of interest as Schiller's introduction to historical drama, in which his greatest dramatic successes were later to be achieved. *Kabale und Liebe*, which was enthusiastically received at Mannheim in April, 1784, was political also, but it was genuinely national and became immediately popular, touching the grander passions of human nature and being recognized as the best German drama of contemporary life.

Under the influence of Wieland (q.v.), Schiller now began to turn *Don Carlos* into blank verse. He left Mannheim (April, 1785) in debt, but famous, and passed nearly two years in Gohlis, near Leipzig, and in Dresden, in close association with Körner, father of the patriotic poet and himself a Mæcenas, who lent Schiller money. Here Schiller's morbid spirit yielded to the excessive hopefulness voiced in his *Ode to Joy* (*An die Freude*) and in some declamatory passages of *Don Carlos*, which was not finished until May, 1787, for work on it had been interrupted by historical and philosophic studies, as well as by an unfinished attempt at prose romance, *Der Geisterseher*. A brief passion for Henriette von Arnim was not allowed to interrupt an ardent affection for the fascinating and emancipated Charlotte von Kalb, and this affection contributed not a little towards Schiller's choice of Weimar as his next place of abode (July, 1787).

The success of *Don Carlos* was Schiller's sufficient passport to the German Athens, whose Duke had already given him a title. Its genuine, heartfelt, and pathetically preposterous enthusiasm for humanity fell in with the spirit of the French Revolution and earned its author, in August, 1792, the honor of French citizenship. Schiller was warmly received in literary Weimar. Herder and Wieland were cordial; Goethe, however, was in Italy. Schiller now turned from the drama to history and in 1788 won scholarly consideration by the first volume of a study of the revolt of the Netherlands from Spain (*Geschichte des Abfalls der Niederlande*). He completed also as much as he ever wrote of *Der Geisterseher* and published two short poems, *Die Künstler* and *Die Götter Griechenlands*, significant because they mark the beginning of the classical influence that was soon to change the whole character of his work. He also did critical work on Wieland's *Deutscher Merkur*, studied Euripides and Homer, and found new joy of life in the acquaintance of Charlotte von Lengefeld (born Nov. 22, 1766), whom he afterward married. With this inspiration he set to work to write himself out of debt, in the course of which he displeased Goethe by criticism of *Egmont*. But, though their relations for six years after their first meeting (Sept. 7, 1788) were those of distant courtesy, Goethe procured Schiller an appointment as adjunct professor of history at Jena, then one of the chief university centres of German culture. Here his first lectures were very successful, but, since the position was not a salaried one, his financial embarrassments continued, till relieved by a stipend of 200 thalers, procured as the result of a suggestion from Frau von Stein (q.v.). Soon afterward he married (February, 1790). In the next year overwork brought on illness, from which Schiller never wholly recovered, but a magnanimous gift from Prince Frederick Christian of Holstein-Augustenburg, of 1000 thalers annually for three years, relieved him from pressing burdens. He completed a history of the Thirty Years' War (1793) and drew from the *Æsthetics* of Kant inspiration for essays on that subject in the literary journals *Thalia* and *Die Horen*, that contributed essentially to the development of taste and criticism in Germany. The most remarkable of these, *On the Naïve and Sentimental in Poetry* (1796), was written after Schiller had formed with Goethe the friendship that was to guide and inspire Schiller's later years.

This period of prose composition had been interrupted in 1793 by illness. Schiller gave up his lectures at Jena and spent a year of travel in search of health. He had now become mentally ripe for intellectual communion with Goethe. Their meeting was a mutual surprise. The acquaintance grew almost immediately to a friendship of rounded completeness; their correspondence extends to more than 1000 letters and is a monument to literary unselfishness. Weimar and Jena being so near to each other, they were constantly together and talked unreservedly of their work and plans. Together they edited *Die Horen*, and soon, through his *Wilhelm Meister*, Goethe won Schiller back to poetry. *Die Ideale*, *Das Ideal und das Leben*, *Der Spaziergang* (1795) are witnesses to this new spirit and mark the highest reach of Schiller's philosophic muse. Their common part in the literary controversy of the day is marked also by the 400 *Xenien*, "parting gifts" of epigram in the *Musenalmanach* (1797).

And now Schiller was ready for the loftiest flights of his dramatic genius. For 10 years this talent had lain fallow, but they were years of æsthetic ripening. The realistic spirit of Goethe inspiring a great idealist was now to produce the classic Schiller. But first came the great ballad year (1797). While arranging materials for *Wallenstein*, on which composition was not begun till November, Schiller wrote *Der Taucher*, *Die Kraniche des Ibykus*, *Der Handschuh*, *Der Ring des Polykrates*, *Ritter Toggenburg*, and *Der Gang nach dem Eisenhammer*, all familiar to every German schoolboy and remarkable for depth and intensity. In 1797 Schiller began also that most prized of longer German lyrics, *Das Lied von der Glocke* (1799), and in 1798 added to the list *Die Bürgschaft* and *Der Kampf mit dem Drachen*. In November, 1797, led by Goethe's counsel, he began to cast somewhat in its present form *Wallensteins Lager*, the introduction to *Die Piccolomini*, and *Wallensteins Tod*, and by New Year he told Goethe that he had surpassed his best former self as "the fruit of our intercourse." It was not, however, till September, 1798, that he saw his way clear to the present trilogy, again during a visit to Goethe, and *Wallensteins Lager*, with the *Prolog*, was acted at Weimar, Oct. 12, 1798, with great enthusiasm. *Die Piccolomini*, the trilogy's second part, was furthered also by Goethe at every turn, and so effectively that it was finished by Christmas and acted on Jan. 30, 1799, to a public which seemed awed by a loftier spirit than had yet crossed the German stage. Again Schiller visited Goethe for three weeks in Weimar, and before the end of March *Wallensteins Tod* was completed. The drama was presented in its complete form April 15, 17, and 20, 1799, ever-memorable days in the annals of Weimar and of the German stage. As an acting play *Wallenstein* has never been

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FROM A PORTRAIT BY ANTON GRAFF

surpassed in Germany. It revealed a new Schiller to the world and to himself. *Wallenstein* was a drama of the Thirty Years' War, of the inevitable conflict between the old order and the new, between genius and duty, between love and loyalty. Schiller left Weimar resolved to put on the stage the tragedy of Mary of Scotland. *Maria Stuart* was elaborated during a visit to Goethe, in May, 1799, and acted in June, 1800. His work suffered constant interruptions from ill health, but he had never shown such mastery of the technique of his craft as in *Maria Stuart*. The versification is smoother than in *Wallenstein*, the arrangement more artistic, the story more dramatically unfolded, but the conception is inferior, and the chief characters lack tragic depth. It is the pathos of Mary's fate more than its tragic necessity that impresses the spectator. Schiller now occasionally replaced Goethe in the management of the Weimar Court Theatre, and thus found occasion to adapt Shakespeare's *Macbeth* to its needs. Traces of this work are obvious in his next romantic tragedy, *Die Jungfrau von Orleans*, an idealization of Joan of Arc, first acted in Leipzig, Sept. 18, 1801. It was an unparalleled popular triumph, for it accorded with the romantic taste. It is now less admired.

In the autumn of 1801 Schiller visited Dresden and was so attracted to ideals of classic art, by what he saw in its museums, that his next drama, *Die Braut von Messina*, was severely classical in structure and conception. It was not completed until 1803. Herein relentless Nemesis appears in awful simplicity. In stateliness and dignity of diction, in classic calm, the drama is greatly admired in Germany, but it did not win popular applause.

Before *Die Braut von Messina* had been acted *Wilhelm Tell*, Schiller's last drama, was already well advanced, and two plays had been adapted from the French of Picard (*Encore des Ménechmes* as *Der Neffe als Onkel* and *Médiocre et Rampant* as *Der Parasit*). Meantime Schiller had been ennobled. He was glad of it "for Lolo's and the children's sake." Work on the final form of *Tell* was begun in August, 1803, and the play was finished in February, 1804, after much study for effects of local color and interruptions from the insatiable, inquisitive Madame de Staël, whose society, he told Goethe, was "suffocating." Her departure from Weimar made him feel "as though he had recovered from a severe illness."

Tell is sharply differentiated from all that goes before. Here success crowns a sane activity, fate yields to will, the visionary reformer of *Die Räuber* and *Don Carlos* has become a practical realist. This growing serenity well befits the poet's last work and crowning achievement. The story of the Swiss hero struck a patriotic chord, for Germany was then on the eve of her deepest humiliation. No German drama had before nor has since produced so deep or enduring an impression. Schiller was invited to Berlin and royally welcomed. Prostrated by illness on his return, he did little during some months of suffering but sketch out *Demetrius*, a drama taken from Russian history, showing that his power of tragic conception and dramatic execution was at its highest at his untimely death in Weimar, May 9, 1805.

Bibliography. Schiller's complete works are published in the following excellent editions: historical-critical edition by K. Goedeke (17 vols., Stuttgart, 1867–76); *Säkular-Ausgabe* edition by Von der Hellen (16 vols., ib., 1904–05); historical-critical edition by Güntter and Witkowski (20 vols., Leipzig, 1909–10). Other valuable editions are: the Hempel edition (1868–74); the Boxberger edition, in *Kürschners National-Literatur* (12 vols., Berlin, 1882–91); the edition by Kutscher and Zisseler (15 parts, ib., 1908); the *Horenausgabe* (16 vols., Munich, 1910 et seq.); the edition of the *Tempel Klassiker* (13 vols., Leipzig, 1910–11); and that in the *Helios Klassiker* (6 vols., ib., 1911). The poems are edited by Viehoff (6th ed., Stuttgart, 1887). An English translation appeared in Bohn's Library (London, 1846–49), with many subsequent ones. Consult: James Sime, *Schiller* (Edinburgh, 1882); Heinrich Düntzer, *Life of Schiller* (Eng. trans. by P. E. Pinkerton, London, 1883); Caroline von Wolzogen, *Schillers Leben* (new ed., Leipzig, 1883); Otto Brahm, *Schiller* (2 vols., Berlin, 1888–92); H. W. Nevinson, *Life of Schiller* (New York, 1889), containing a bibliography; Jakob Minor, *Schiller: sein Leben und seine Werke* (vols. i–ii, Berlin, 1890), incomplete; Thomas Carlyle, *Life of Schiller* (Centenary ed., New York, 1899); Calvin Thomas, *Life and Works of Friedrich Schiller* (ib., 1901); Paul Carus, *Friedrich Schiller: Sketch of his Life and Appreciation of his Poetry* (Chicago, 1905); Albert Ludwig, *Schiller: sein Leben und Schaffen dem deutschen Volke erzählt* (Berlin, 1912); Karl Berger, *Schiller: sein Leben und seine Werke* (8th ed., Munich, 1914); Eugen Kühnemann, *Schiller* (5th ed., ib., 1914). Consult also Schiller's complete correspondence by F. Jonas (7 vols., Stuttgart, 1892–96); Schiller's correspondence with Goethe, Graef, and Leitzmann (3 vols., Leipzig, 1912), Humboldt (Stuttgart, 1876; new ed., 1895–96), his wife, Charlotte von Schiller (ed. by Fielitz, 3 vols., 5th ed., ib., 1905), and her sister (ib., 1879), Körner (new ed., ib., 1895–96); J. Petersen, *Schillers Persönlichkeit* (1908–1911). For critical studies: Kuno Fischer, *Schiller, Drei Vorlesungen* (Frankfort, 1858–61); id., *Friedrich Schiller: Akademische Festrede* (Leipzig, 1860); the curious collection of contemporary criticisms in J. W. Braun, *Schiller und Goethe, Urtheile ihrer Zeitgenossen* (Berlin, 1882); and the following monographs: Eduard Belling, *Die Metrik Schillers* (Breslau, 1883); Friedrich Ueberweg, *Schiller als Historiker und Philosoph* (Leipzig, 1884); Wilhelm Fielitz, *Studien zu Schillers Dramen* (ib., 1886); Albert Köster, *Schiller als Dramaturg* (ib., 1890); H. A. Bulthaupt, *Dramaturgie* (9th ed., Oldenburg, 1902); Ludwig Bellermann, *Schillers Dramen* (3d ed., 3 vols., Berlin, 1905–08); E. C. Parry, *Schiller in America* (Philadelphia, 1905); Thomas Rea, *Schiller's Dramas and Poems in England* (London, 1906); O. Falkenberg, *Schillers Dramaturgie* (Munich, 1909); Albert Ludwig, *Schiller und die deutsche Nachwelt* (Berlin, 1909); K. Weitbrecht, *Schiller in seinen Dramen* (2d ed., Stuttgart, 1909); Arthur Böhtlingk, *Shakespeare und Schiller* (Leipzig, 1910); E. C. Wilm, *The Philosophy of Schiller in its Historical Relations* (Boston, 1913); Felix Kuberka, *Der Idealismus Schillers* (Heidelberg, 1913). Translations of Schiller's lyrics by Merivale (London, 1844), Gowring (ib., 1851), and Lytton (ib., 1887) are noteworthy, as is Coleridge's condensed version of *Wallenstein*. Documents and other memorials of Schiller are

in the Schiller Archiv, united in 1889 with the Goethe Archiv in Weimar. The *Schiller-Stiftung* is a fund raised to commemorate the centenary of the poet's birth, its income being devoted to the aid of needy men of letters.

SCHIL'LING, JOHANNES (1828–1910). A German sculptor. He was born at Mittweida, Saxony, and studied chiefly under Rietschel at Dresden and under Drake at Berlin. After studying for three years in Rome he returned to Dresden and became professor in the Academy in 1868. His first works to attract attention were the four charming groups "Morning," "Noon," "Evening," and "Night" on the Brühl Terrace in Dresden; of importance also are the monument to Schiller at Vienna, the Soldiers Monument at Hamburg, the colossal group of "Dionysos and Ariadne" on the façade of the Royal Theatre at Dresden, and the monuments to Emperor William I and to Bismarck at Wiesbaden. His masterpiece is the celebrated national monument in the Niederwald (unveiled in 1883), which is poetic in conception, but lacking in strength and unity. His works represent the transition from the classical to the romantic style and are characterized by grace and careful execution. Many of the models are in the Schilling Museum, Dresden.

SCHILLINGS, shĭl'ĭŋks, MAX (1868–). A German composer and orchestral conductor, born at Düren. While pursuing his studies at the Gymnasium of Bonn he studied music with Brambach and Königslöw. After three years of further study at Munich he settled there. In 1902 he was appointed chorus master at Bayreuth and in 1908 conductor of the Opera and Symphony concerts at Stuttgart, with the title of Generalmusikdirektor. As a composer he shows decided talent, but unfortunately allows himself to be strongly influenced by Wagner, thus sacrificing his individuality. His works include the symphonic fantasias *Meergruss* and *Seemorgen;* a rhapsody for mixed chorus and orchestra, *Dem Verklärten;* a string quartet; songs. Among his best works are Schiller's *Kassandra* and *Eleusisches Fest,* Spitteler's *Glockenlieder,* and especially Wildenbruch's *Hexenlied* with illustrative music for piano or orchestra. His music dramas, entirely in Wagner's later style, are: *Ingwelde* (1894); *Der Pfeifertag* (1899); *Moloch* (1906); *Mona Lisa* (1915). He also wrote incidental music to Æschylus' *Orestes* and the first part of Goethe's *Faust.* Consult R. Louis, *Max Schillings,* in vol. iii of *Monographien moderner Musiker* (Leipzig, 1909).

SCHIMPER, shĭm'pĕr, KARL FRIEDRICH (1803–67). A German botanist, the pioneer of modern botanical morphology. He was born in Mannheim and was educated for the Church, but in 1826 began the study of botany at Munich. There he was docent for many years, spending much of his time in geological expeditions in the Alps and Pyrenees. In 1849 he received a pension from the Grand Duke of Baden and removed to Schwetzingen. Schimper's *Beschreibung des Symphytum Zeyheri* (1835) expressed the theory of phyllotaxis, which he had formulated several years before and which is his chief claim to fame. Consult Volger, *Leben und Leistungen des Naturforschers Karl Schimper* (Frankfort, 1889).

SCHIMPER, WILHELM PHILIPP (1808–80). A German geologist and botanist, best known for his valuable studies of the mosses. He was born in Dosenheim, Alsace, studied in Strassburg, and in 1835 became assistant in the University Museum of Natural History, of which he was made director in 1839. He taught mineralogy and geology in the University of Strassburg and wrote: *Bryologia Europæa* (1836–55; supplement, 1864–66), with Bruch and Gümbel; *Palæontologica Alsatica* (1854); *Icones Morphologicæ* (1860); *Traité de paléontologie végétale* (1869–74). Consult Grade, *Guillaume Philippe Schimper* (Colmar, 1882).

SCHINDLER, shĭn'dlĕr, JULIUS ALEXANDER (1818–85). A German author. He was born in Vienna, where he studied first chemistry and then law. He was a public official from 1845 till 1870, when he retired and devoted himself to literature. Among his works are: *Oberösterreich: Ein Skizzenbuch* (1848); *Die Geschichte vom Scharfrichter Rosenfeld* (1852); *Gedichte* (1871; 3d ed., 1876); *Der Schelm von Bergen* (1879; 5th ed., 1893); the posthumous novel *Oberst Lumpus* (1888). Schindler used as a pen name Julius von der Traun.

SCHINDLER, shĭn-dlĕr, SOLOMON (1842–1915). An American rabbi. He was born at Neisse, Germany, and was educated at Breslau. Coming to the United States in 1871, he was minister of Jewish congregations at Hoboken, N. J., and in Boston until 1894. He was also a member of the Boston School Board in 1888–94. In 1895–99 he was superintendent of the Federation of Jewish Charities of Boston and thenceforth until 1909, when he retired, served as superintendent of the Leopold Morse Home. Schindler was author of *Messianic Expectations and Modern Judaism* (1886); *Dissolving Views of the History of Judaism* (1888); *Young West: A Sequel to Bellamy's Looking Backward* (1894).

SCHINKEL, shĭŋk'el, KARL FRIEDRICH (1781–1841). A German architect. He was born at Neuruppin, Brandenburg, March 13, 1781, and studied drawing and design at Berlin under David and Friedrich Gilly. In 1803 he went to Italy, but on his return in 1805 he found the aspect of public affairs so threatening that he could obtain little employment and was forced to take up landscape painting. In May, 1811, he was elected a member of, and in 1820 became professor at, the Berlin Academy of Fine Arts. Other offices and honors were also conferred on him. He died at Berlin, Oct. 9, 1841. His principal structure was the Old Museum (1825–30), an admirable edifice in Greek style. Other designs to which he chiefly owes his reputation are those of the Royal Guardhouse (1816–18), the Royal Theatre (1819–21), the memorial of the War of the Liberation (1821), the palace bridge (1822–24), the new Potsdam Gate, the artillery and engineers' school in Berlin, the casino and the church of St. Nicholas in Potsdam, and a great number of castles, country houses, churches, and public buildings. Schinkel was a man of powerful and original genius; his designs are remarkable for the unity of idea by which they are pervaded and the vigor, beauty, and harmony of their details. His tendencies were classical, and he succeeded to some extent in adapting Grecian forms to the need of modern buildings. Consult *Aus Schinkels Nachlass* (ed. by Wolzogen, Berlin, 1862–64) and the biographies by Kugler (ib., 1842), Bötticher (ib., 1857), Quast (Neuruppin, 1866), Hermann Grimm, Woltmann, Dohme (Leipzig, 1882),

Pecht (Nördlingen, 1885), and Ziller (ib., 1897).

SCHINZ, shĭnts, ALBERT (1870–). An American French and philosophical scholar, born at Neuchâtel, Switzerland. He graduated in 1888 from the university of his native city and studied also at Berlin, Tübingen (Ph.D., 1894), Paris, and, in the United States, at Clark University. After a year of teaching at the University of Minnesota he became professor of French literature at Bryn Mawr College in 1899 and in 1913 accepted a similar chair at Smith College. Besides editing the works of French authors and contributing to reviews and to the NEW INTERNATIONAL ENCYCLOPÆDIA he published: *Anti-Pragmatism: An Examination into the Respective Rights of Intellectual Aristocracy and Social Democracy* (1909); *J. J. Rousseau: A Forerunner of Pragmatism* (1909); *Accent dans l'écriture française* (1912); *La question du "Contrat Social"* (1913).

SCHIO, skē'ō. A town in the Province of Vicenza, Italy, 20 miles by rail northwest of Vicenza (Map: Italy, C 2). It has an eighteenth-century cathedral and noted wool factories. There are also marble quarries and silk, clay, glass, and dye works. Pop. (commune), 1901, 13,494; 1911, 14,347 (town 10,200).

SCHIPPER, shĭp'ẽr, JAKOB (1842–). A German philologist and English scholar, born in Oldenburg. He studied modern languages in Bonn, Paris, Rome, and Oxford, collaborated on the revision of Bosworth's Anglo-Saxon Dictionary, and was professor of English philology at Königsberg from 1872 until 1877, when he was called to a like chair in Vienna. Honorary degrees were conferred on him by Aberdeen, St. Andrews, Edinburgh, Oxford, and Cambridge. He was elected to the Vienna Academy of Sciences in 1887 and acted as editor of the *Wiener Beiträge zur englischen Philologie* (1895–1900). Schipper published *Englische Metrik* (1881–88), an important work, supplemented by a *Grundriss der englischen Metrik* (1895); *Zur Kritik der Shakespeare-Bacon-Frage* (1889); *Der Bacon-Bacillus* (1896); editions of the Alexius legends (1877–87), of Dunbar's poems (1892–94), and of Alfred's version of Bede's ecclesiastical history (1897–99); *History of English Versification* (1910); *James Shirley: sein Leben und seine Werke* (1911); and other contributions to English philology.

SCHIRMER, shêr'mẽr, JOHANN WILHELM (1807–63). A German landscape painter and etcher, born at Jülich. He studied at Düsseldorf, where he was a follower of Lessing, and in 1853 was appointed director of the art school at Karlsruhe. He became known as one of the first of the so-called Düsseldorf landscape school. His early work showed realistic tendencies, but after a visit to Italy in 1840 he adopted the sentimental-classical style of landscape. Characteristic examples are: "The Grotto of Egeria" (1842), in the Leipzig Museum; "Twelve Scenes from the History of Abraham" (1859–62), in the National Gallery at Berlin; and four scenes of the "Good Samaritan" (1857) at Karlsruhe.

SCHISM, sĭz'm, WESTERN or GREAT. A celebrated disruption of communion in the Catholic church, which arose out of a disputed claim to the succession to the papal throne. On the death of Gregory XI, in 1378, a Neapolitan, Bartolommeo Prignano, was chosen Pope by the majority of the cardinals in a conclave at Rome, under the name of Urban VI. Soon afterward, however, a number of these cardinals withdrew, revoked the election, which they declared not to have been free, owing to the violence of the factions in Rome by which the conclave had, according to them, been overawed; and in consequence they proceeded to choose another Pope under the name of Clement VII. The latter fixed his seat at Avignon, while Urban VI lived at Rome. Each party had its adherents, and in each a rival succession was maintained down to the Council of Pisa in 1409, in which assembly both popes, the Roman Pope Gregory XII and the Avignon Pope Benedict XIII (Pedro de Luna), were deposed, and a third, Alexander V, was elected. He died a few months later and was succeeded by John XXIII. A new council was convoked at Constance in 1414, by which not alone the former rivals, but even the new pontiff elected, by consent of the two parties, at Pisa, were set aside, and Otto Colonna was elected under the name of Martin V. In this election (1417) the whole body may be said to have acquiesced; but one of the claimants, Benedict XIII, remained obstinate in the assertion of his right till his death, in 1424. Consult, especially, Gayet, *Le grand schisme d'occident, d'après les documents contemporains* (Paris, 1899 et seq.), and the authorities referred to under PAPACY.

SCHIST, shĭst. The name given to those crystalline rocks of the metamorphic class that possess a well-marked parallel structure and capacity for cleavage, which properties are imparted by the presence of some foliated mineral like mica, talc, chlorite, or a fibrous one like amphibole. The characteristic mineral ingredient may be prefixed to the name, e.g., biotite schist, tremolite schist, etc. Unlike the gneisses, which also exhibit some degree of parallelism in mineral arrangement, the schists contain little or no feldspar, though often carrying considerable quartz. They are common rocks in all metamorphic regions, but have little value for quarry purposes. See METAMORPHIC ROCKS.

SCHISTOSITY, shĭs-tŏs'ĭ-tĭ, or FOLIATION. A structure exhibited by many metamorphosed rocks, which is characterized by a parallel arrangement of the minerals and a tendency to split or cleave into plates. It is produced by a recrystallization of the constituents of a rock under the influence of metamorphic processes, such as heat and great pressure. Among the crystalline schists this structure is very prominent, such types as chlorite schist, talc schist, and actinolite schist cleaving almost as readily as slate. Igneous rocks which have cooled under pressure may also exhibit a parallelism of arrangement akin to foliation. See CLEAVAGE.

SCHIZOGAMY, skĭ-zŏg'a-mĭ (from Gk. *σχίζειν, schizein,* to split + *γάμος, gamos,* marriage). That method of reproduction in which a sexual worm is produced (1) by fission or self-division, when it is said to be fissiparous, or (2) by budding or gemmation, from a sexless worm, such as occurs in *Syllis,* etc., when it is said to be gemmiparous. Thus, schizogamy is a form of parthenogenesis (q.v.).

SCHIZOGONY, skĭ-zŏg'o-nĭ (from Gk. *σχίζειν, schizein,* to split + *-γονία, -gonia,* generation, from *γόνος, gonos,* seed). A kind of asexual generation, or self-fission, observed in many ophiuroids (q.v.) or brittle stars, especially in the young, and also in starfishes, as species of *Asterias,* etc. In such cases the animal voluntarily divides through the disk in the shortest

direction, i.e., from the mouth (oral) side to the upper (aboral) side, each separate half regenerating the missing parts as well as the additional arms. The division is brought about in most cases, and perhaps all, says Morgan, by the contraction of the muscles, and their arrangement in connection with the form of the body is the real cause of the act. Cf. REGENERATION.

SCHIZOMYCETES, skĭz'ō-mī-sē'tēz (Neo-Lat. nom. pl., from Gk. *σχίζειν, schizein,* to split + *μύκης, mykes,* mushroom), BACTERIA, FISSION FUNGI. A group of Thallophytes (q.v.) closely related to the blue-green algæ (Cyanophyceæ, q.v.). They are fungi in the sense that in general they do not contain chlorophyll (q.v.), but they are quite distinct from true fungi.

VARIOUS FORMS OF BACTERIA.

Bacteria include the smallest known organisms and are one-celled forms, which occur either in separate cells or in colonies (usually filamentous). They are poorly differentiated morphologically, so that the species are usually not recognizable except by means of their behavior in cultures. See BACTERIA.

SCHIZOPHYTES, skĭz'ō-fīts. See SCHIZOMYCETES; ALGÆ.

SCHIZOP'ODA. See CRUSTACEA; OPOSSUM SHRIMP.

SCHJERING, shyā'rĭng, OTTO KARL WILHELM VON (1853–). A German military surgeon. He was born at Eberswalde, studied medicine at the Kaiser-Wilhelms-Akademie at Berlin (M.D., 1877), and held several posts as army surgeon before becoming in 1905 surgeon-general of the army with the rank of lieutenant general (1907). In 1909 he received hereditary nobility. During the European War (1914 et seq.) he was especially active, and it was largely the result of his initiative and surveillance that the German sanitary corps was in such an excellent condition at the beginning of the war and during its course.

SCHLAGINTWEIT, shlä'gĭnt-vīt. The name of three explorers, sons of the Bavarian oculist Joseph Schlagintweit (1792–1854). HERMANN VON SCHLAGINTWEIT (1826–82), ADOLF (1829–57), and ROBERT (1833–85) traveled widely in Europe and Asia, and in 1859 were raised to the nobility by the King of Bavaria. Hermann and Adolf first attracted attention by their writings on the geography of the Alps, entitled *Untersuchungen über die physikalische Geographie der Alpen* (1850) and *Neue Untersuchungen* (1854), which included an atlas and a dissertation on the physical geography of the Kaisergebirge. In 1851 Hermann became privatdocent in meteorology and physics at the University of Berlin, and two years later Adolf began to lecture on geology at Munich. In the spring of the latter year the three brothers received commissions from the King of Prussia and from the British East India Company to study the meteorology and geology of the Himalaya Mountains. They reached Bombay in October, 1854, and proceeded thence by different routes over the Deccan to Madras. During the next spring and summer Adolf and Robert explored the Northwest Provinces, traversed the passes of the main chain of the Himalaya, and, after passing the Ibi Gamin (which they ascended to the height of 6788 meters, the greatest altitude then attained by scientists), entered Tibet. In 1856 they went to Simla, where they were joined by Hermann, who had been in Sikkim and Assam. From Simla they again crossed the Western Himalaya into Tibet; and then, while Hermann and Robert went to Leh in Ladakh and crossed the Karakorum and the Kuen-lun, Adolf explored western Tibet and the country about the upper Indus. Later in the year Robert crossed the country drained by the Indus. Afterward Hermann and Robert settled in Berlin, where they opened a museum and spent much of the remainder of their lives studying and classifying their collections. Adolf went once more to Leh and again crossed the Karakorum and the Kuen-lun. In August, 1857, while traveling in Chinese Turkestan, he was arrested, taken to Kashgar, the capital, and there beheaded. Hermann and Robert published a report of their explorations under the title *Results of a Scientific Mission to India and High Asia* (with atlas, 1860–66), the substance of which Hermann subsequently translated into German as *Reisen in Indien und Hochasien* (1869–80). Robert became in 1863 professor in Giessen and later traveled extensively in the United States and recorded his impressions in several works, including: *Die Pacific Eisenbahn* (1870); *Kalifornien* (1871); *Die Mormonen* (1874; 2d ed., 1877); *Die Prärien* (1876); *Santa Fé- und Südpacific Bahn.* Another brother, EMIL (1835–1904), is known for his studies of the language and history of Tibet and is the author of *Buddhism in Tibet* (1863), *Indien in Wort und Bild* (1880; 2d ed., 1890), etc.

SCHLAN, shlän. A town of Bohemia, Austria, 44 miles by rail northwest of Prague (Map: Austria, D 1). It has a Franciscan monastery, agricultural, art, and industrial schools, and several hospitals. There are extensive coal fields and important manufactures of iron, machinery, chemicals, and cotton. Pop., 1900, 9494; 1910, 9685.

SCHLANGENBAD, shläng'en-bät. A well-known watering place, 5 miles northwest of Wiesbaden, Germany. It is delightfully situated in a forested vale and is mostly frequented by women. The waters are alkaline. The old Kurhaus dates from 1694. Pop., 1900, 374; 1910, 428.

SCHLATTER, shlät'ĕr, ADOLF VON (1852–). A German theologian, born in Saint-Gall, Switzerland. He was educated at Basel and Tübingen (1872–75), was privatdocent and associate professor at Bern (1888), and served as full professor at Greifswald (1888–93), at Berlin (1893–98), and at Tübingen thenceforth. After 1897 he was an associate editor of *Beiträge zur Föderung der christlichen Theologie.* He

wrote: *Der Glaube im Neuen Testament* (1885; 2d ed., 1896); commentaries on Romans (3d ed., 1895), on Hebrews (3d ed., 1898), on James and the Johannine Epistles (2d ed., 1900), on Matthew (2d ed., 1900), on John (1899), and on Mark and Luke (1900); *Zur Topographie und Geschichte Palästinas* (1893); *Geschichte Israels von Alexander dem Grossen bis Hadrian* (1901); *Predigten in der Stiftskirche zu Tübingen gehalten* (8 vols., 1902–10); *Die Theologie des Neuen Testaments* (2 parts, 1909); *Die philosophische Arbeit seit Cartesius nach ihrem ethischen und religiösen Ertrag* (1910); *Das christliche Dogma* (1911); *Das Wunder in der Synagoge* (1912); *Die hebräischen Namen bei Josephus* (1913).

SCHLATTER, Francis (1856?–1922). A cobbler who, because of miraculous cures attributed to him, became known as the Healer. He was born of German peasants in the village of Elser in Alsace-Lorraine. In 1884 he emigrated to the United States, where he worked at his trade in various cities until 1892, when he thought that a voice bade him sell his business, give the money to the poor, and devote his life to healing the sick. He was then in Denver, Colo., but soon after entering upon his mission left that city and traveled about on foot till his peregrinations brought him to Albuquerque. There he suddenly became famous. Crowds gathered about him daily, hoping to be cured of their diseases by simply clasping his hands. The following month he returned to Denver, but did not resume his healings until September. Schlatter is said to have refused all rewards for his services. His manner of living was of the simplest, and he taught no new doctrine. He said only that he obeyed a power which he called Father, and from this power he claimed to receive his healing virtue. On November 13 he disappeared, leaving behind him a note in which he said that his mission was ended. In February, 1907, a person purporting to be Schlatter appeared in New York and attempted cures on the sick and afflicted.

SCHLECHTA-WSSEHRD, shlĕk'tȧ-vzhā'-h'rt, Ottokar Maria, Baron von (1825–94). An Austrian Orientalist, born in Vienna. He studied there, was dragoman in Constantinople from 1848 to 1860, and from 1870 to 1874 was Consul General at Bucharest, whence he was transferred to Teheran to act as Minister to Persia. The Schlechta collection of Oriental manuscripts is now in the Vienna Imperial Library. He wrote: *Die Frühlingsgarten von Dschâmi* (1846), Persian text and German translation; *Kitâbi Hukouki Milèl, or Europäische Völkerrecht* (2 vols., 1847–48), in Turkish; *Der Fruchtgarten von Saadi* (1852); *Ibn Jemins Bruchstücke* (1852; 2d ed., 1879); *Die osmanischen Geschichtschreiber der neuern Zeit* (1856); *Manuel terminologique français-ottoman* (1870); a translation of Firdausi's *Jussuf und Suleicha* (1889); *Moralphilosophie des Morgenlandes* (1892).

SCHLEGEL, shlā'gel, August Wilhelm von (1767–1845). A distinguished German critic, poet, and Orientalist. He was born at Hanover, Sept. 8, 1767, and studied at Göttingen. He first began to win prominence in literature, while a lecturer at Jena, by his contributions to Schiller's *Horen* and *Musenalmanach* and to the *Allgemeine Litteraturzeitung*. About the same time his translation of Shakespeare began to appear (1797–1810), the influence of which on German poetry and on the German stage was great. The poet Tieck undertook a revision of the work, together with a translation of such plays as Schlegel had omitted (1825, 1839, 1843). The Schlegel-Tieck translation (completed by Count Baudissin and Dorothea Tieck under Tieck's supervision, 1825–33) is by many considered better than any other rendering of Shakespeare in a foreign language. Thanks to Schlegel and Tieck, Shakespeare has become a national poet of Germany. Schlegel also delivered at Jena a series of lectures on æsthetics, etc., and, with his brother Friedrich (q.v.), edited the *Athenäum* (1798–1800), a severely critical authority of high rank. He published, besides his first volume of poems, *Gedichte* (1800), and, in company with his brother, the *Charakteristiken und Kritiken* (1801). In 1801 Schlegel went from Brunswick, where he spent the winter, to Berlin, where he gave a series of lectures on literature, art, and the spirit of the time. In 1803 appeared his *Ion*, an antique tragedy of considerable merit. It was followed by his *Spanisches Theater* (1803–09), consisting of five pieces of Calderôn's, admirably translated, the effect of which has been to make that poet a favorite with the German people, and his *Blumensträusse italienischer, spanischer und portugiesischer Poesie* (Berlin, 1804), a charming collection of southern lyrics, from the appearance of which dates the naturalization in German verse of the metrical forms of the Romanic races. In 1804, having become estranged from his gifted wife Caroline, a daughter of Professor Michaelis of Göttingen (consult Caroline's *Briefe aus der Frühromantik*, ed. by E. Schmidt, 2 vols., Leipzig, 1913), Schlegel entered the household of Madame de Staël as a tutor of her children. He traveled much, visiting Italy, France, Austria, and Sweden. He wrote in French a *Comparaison de la Phèdre d'Euripide avec celle de Racine* (1807). Probably his most valuable and certainly his most widely popular work was the *Vorlesungen über dramatische Kunst und Litteratur* (1809–11), originally delivered at Vienna in the spring of 1808 and translated into most European languages.

Between 1811 and 1815 Schlegel published a new collection of his poems (*Poetische Werke*), which contains his masterpieces, "Arion," "Pygmalion," "Sankt Lucas," and is notable for the richness and variety of its poetic forms. In 1818 Schlegel, now raised to the nobility, was appointed professor of history in the University of Bonn and devoted himself especially to the history of the fine arts and to philological research. He was one of the first students of Sanskrit in Germany and published at Bonn an *Indische Bibliothek* (1820–26). About 1817 Schlegel married a daughter of Professor Paulus of Heidelberg, but they parted in 1821. Schlegel was quarrelsome, jealous, and ungenerous in his relations with literary men and did not shrink even from slander when his spleen was excited. He died in Bonn, May 12, 1845. Schlegel's complete works appeared in 12 volumes (Leipzig, 1846–47). Consult: article in *Allgemeine deutsche Biographie*, vol. xxxiii, pp. 737–752; M. Bernays, *Zur Entstehungsgeschichte des Schlegelschen Shakspeare* (Leipzig, 1872); R. Haym, *Romantische Schule* (new ed., Berlin, 1902); Karl Alt, *Schiller und die Gebrüder Schlegel* (Weimar, 1904); Jonas Fränkel (ed.), *Aus der Frühzeit der Romantik* (Berlin, 1907);

A. A. Helmholtz, *Indebtedness of Samuel Taylor Coleridge to August Wilhelm von Schlegel* (Madison, Wis., 1907), containing a bibliography.

SCHLEGEL, Friedrich von (1772–1829). A German literary historian, critic, and writer on æsthetics, brother of August Wilhelm von Schlegel (q.v.), born at Hanover. He studied philosophy at Göttingen and Leipzig and in 1797 published his first work, *Die Griechen und Römer*, which was followed in 1798 by his *Geschichte der Poesie der Griechen und Römer*. The chief vehicle at this time for the dissemination of his philosophical views of literature was the *Athenäum*, an organ of the Romantic school, edited by himself and his brother. In *Lucinde*, an unfinished novel (1799), he cynically reveals his relations with Dorothea Veit, who had left her husband, a Berlin banker, in 1798 and ultimately married Schlegel in Paris (1804). Proceeding to Jena, he began there in 1800 as a privatdocent, delivering lectures on philosophy, which met with small favor, and still editing the *Athenäum*, to which he also began to contribute poems of his own. In 1802 appeared his *Alarcos*, a tragedy, in which the Classical and Romantic elements are queerly blended. From Jena he soon went to Paris, where he gave philosophical lectures, edited the *Europa*, a monthly journal (1803), and applied himself to the languages of southern Europe and to Sanskrit, the fruits of which were seen in his treatise *Ueber die Sprache und Weisheit der Indier* (1808). During his residence in Paris he also published a *Sammlung romantischer Dichtungen des Mittelalters* (1804).

He returned to Germany in 1804 and settled at Cologne. There, in 1808, he and his wife joined the Roman Catholic church, a change which greatly affected his future literary career. In the same year Schlegel went to Vienna, where he was employed by the Archduke Charles as a secretary and wrote fervent proclamations against Napoleon. In 1811 appeared the lectures he had delivered at Vienna, under the title *Ueber die neuere Geschichte*, and in 1815 his *Geschichte der alten und neuen Litteratur* (Eng. trans. by Lockhart, 2 vols., Philadelphia, 1818; 2d ed., New York, 1845). In 1822–25 a collected edition of his writings in 10 volumes was published by himself, and in 1846 a new edition in 15 volumes was issued. Subsequently he delivered at Vienna and Dresden lectures on the "Philosophy of Life" (1828), on the "Philosophy of History" (1829; Eng. trans. by Robertson, London, 1835; 6th ed., 1852), and on the "Philosophy of Language" (1830). His manuscripts were published at Bonn, 1836–37, and his *Prosaischen Jugendschriften* were edited by Minor in 1882 (2 vols.; 2d ed., 1906). His æsthetic and miscellaneous works were translated by Millington (London, 1900).

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SCHLEICHER, shlīk'ẽr, August (1821–68). A German philologist, born at Meiningen, and educated at Leipzig, Tübingen, and Bonn. After spending four years as a docent at Bonn, in 1850 he was appointed assistant professor at Prague, becoming full professor three years later. Here he began the study of Lithuanian and the Slavic languages. In 1857 he was called to Jena as professor of linguistic science and Germanic philology and remained there until his death. Schleicher's importance in the history of comparative philology is due to the fact that he sums up in his *Kompendium der vergleichenden Grammatik der indogermanischen Sprachen* (1861–64; 4th ed., 1876; Eng. trans. by Bendall, 2 parts, London, 1874–77) the results achieved by the science up to that date. His *Handbuch der litauischen Sprache* (2 vols., 1856–57) is still of value, while his *Deutsche Sprache* (1860; 5th ed., 1888) is a book of more popular interest. Among his other works the most important are: *Sprachvergleichende Untersuchungen* (2 vols., Bonn, 1848–50); *Die Sprachen Europas* (1850); *Formenlehre der kirchenslawischen Sprache* (1852); *Beiträge zur vergleichenden Sprachforschung* (5 vols., 1858–68); *Die Darwinsche Theorie und die Sprachwissenschaft*, in which he enunciated the so-called *Stammbaumtheorie* of the origin of dialects (see Philology) (1863; 3d ed., 1873); an edition of the Lithuanian poems of Christian Donaleitis (1865); and the posthumous *Laut- und Formenlehre der polabischen Sprache* (1871). Consult Lefmann, *August Schleicher* (Leipzig, 1870).

SCHLEIDEN, shlī'den, Matthias Jakob (1804–81). A German botanist, born at Hamburg. After beginning a course of law at Heidelberg, he turned his attention to natural history and studied for several years at the universities of Göttingen and Berlin. In 1839 he became a professor of botany at Jena. There he remained until 1863 and after a brief residence at Dresden became in 1864 professor of botanical chemistry and anthropology at the University of Dorpat. After a year he returned to Germany (living in Dresden and Wiesbaden) and devoted himself to private research and authorship. His most important work was his *Grundzüge der wissenschaftlichen Botanik* (2 vols., 1842; 4th ed., 1861), in which he emphasized the inductive method of botanical research and sharply attacked the hazy philosophical treatment of morphological questions. Among his other works were: *Die Pflanze und ihr Leben* (1848; 6th ed., 1864); *Handbuch der medizinisch-pharmazeutischen Botanik* (1852–57); *Die Landenge von Sues* (1858); *Zur Theorie des Erkennens durch den Gesichtsinn* (1861); *Das Alter des Menschengeschlechts* (1863); *Das Meer* (1865; 3d ed., 1888); *Für Baum und Wald* (1870); *Die Rose* (1873); *Das*

Salz (1875); *Die Romantik des Martyriums bei den Juden im Mittelalter* (1878).

SCHLEIERMACHER, shlī'er-mäk'ĕr, Friedrich Ernst Daniel (1768–1834). A German theologian and philosopher, born in Breslau. Strong religious influences were brought to bear upon the boy, not only at home, but also at the Moravian schools in Niesky and Barby, where he spent four years (1783–87). For two years (1787–89) he studied at the University of Halle. In 1794 he was ordained to the ministry and became assistant to a clergyman at Landsberg. In 1796 he was appointed chaplain at the Charité Hospital in Berlin, where he continued for six years. He was on terms of intimate friendship with the Romanticists, especially Schlegel, and he sympathized with many of their aims, yet with a conviction of the necessity of religion which they did not share. His first important literary work, *Ueber die Religion*, five discourses upon religion (1799), was designed to vindicate the claims of religion to the respect of the cultivated. In the discourses one can trace a pantheistic tendency, derived from Spinoza. The *Monologen* were published in 1800 and exhibit the influence of Fichte's subjective idealism. The first collection of Schleiermacher's sermons appeared in 1801. From 1802 to 1804 Schleiermacher was court preacher at Stolpe in Pomerania, where he published his *Grundlinien einer Kritik der bisherigen Sittenlehre*. For the next two years he was professor extraordinary and university preacher at Halle, where he began the publication of his translation of Plato, which gave him an assured position among scholars. Here also he wrote a critical essay on *First Timothy*, rejecting the Pauline authorship, chiefly on the basis of internal evidence. In 1809 he took up his permanent residence in Berlin, where he became pastor of the *Dreifaltigkeitskirche* and professor at the newly founded university. His influence over the Protestant church for a quarter of a century was most marked, and he may almost be said to have dominated contemporary German theology. At the third centennial anniversary of the Protestant Reformation (1817) Schleiermacher took an active part in promoting the union of Lutheran and Reformed churches. His *Kurze Darstellung des theologischen Studiums* (1811) was an important contribution to that subject and proved of great value in rightly directing the development of theological education in Germany. Probably the most important of all Schleiermacher's writings was his treatise on Christian faith, commonly cited under the name *Glaubenslehre* (1821; 3d ed., 1835), one of the truly great theological systems of history. For insight, grasp, and power of presentation it has properly been compared with the works of Origen and Calvin, but in its general point of view it resembles the former far more than the latter. The *Grundriss der philosophischen Ethik* was published posthumously by his pupil Twesten (1841).

The works and teaching of Schleiermacher mark an epoch in the history of Christian thought. He restored religion to its place as a normal and necessary element of human nature by pointing out a neglected factor, feeling. Rationalistic morals had for a long time usurped the place which religion ought to occupy, but had left men dissatisfied. Schleiermacher recalled them to their rightful spiritual privileges. Indeed, in his analysis of religion, he overemphasized the truth he had rediscovered, making religion consist essentially in a "feeling of absolute dependence." The subjective character of his theology laid him open to severe criticism from the orthodox side, yet so genuine was his religious faith, and so central was the place of Christ in his teaching, that he escaped ecclesiastical censure. His influence has been strongly felt in Great Britain and America. Schleiermacher's *Sämmtliche Werke*, in 30 volumes, appeared at Berlin in 1835–64. Of his works there have appeared in English, *Critical Essay on the Gospel of Luke* (London, 1825); *Introductions to the Dialogues of Plato* (Cambridge, 1836); *Selected Sermons* (trans. by M. F. Wilson, London, 1890); *Christmas Eve* (trans. by W. Hastie, Edinburgh, 1890); *Speeches* (*Reden*) (trans. by John Oman, London, 1893).

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SCHLEIZ, shlīts. The second residence town of the Principality of Reuss, Younger Line, Germany, in a fertile district, 20 miles northwest of Plauen, on the Wiesenthal. Among the architectural features of the town are a late Gothic church with the burial vaults of the rulers, and the palace of the Prince with a library. Schleiz has a provincial deaf and dumb asylum, industrial art schools, and a workhouse. It manufactures cotton and woolen goods, metal wares, and toys. In the vicinity is a picturesque castle, belonging to the Prince. Pop., 1900, 5331; 1910, 5624.

SCHLEMIAL, Peter. See Thoma, Ludwig.

SCHLESINGER, slĕs'ĭn-jĕr, Frank (1871–). An American astronomer. Born in New York City, where he graduated from the City College in 1890 and from Columbia (Ph.D.) in 1898, he was an observer in charge of the International Latitude Observatory at Ukiah, Cal., from 1899 to 1903, served as an astronomer at the Yerkes Observatory in 1903–05, and thenceforth had charge of the Allegheny Observatory at the University of Pittsburgh. Schlesinger is author of many papers on reduction of astronomical photographs, spectroscopic binaries, stellar parallaxes, variables of the Algol type, and variations of latitude.

SCHLESWIG, shlās'vĭk *or* shlĕs'vĭk (Dan. *Slesvig*). Until 1864 a duchy belonging to Denmark, separated from Holstein by the Eider (Map: Denmark, C 4). In 1866 it was annexed to Prussia as a part of the Province of Schleswig-Holstein (q.v.).

SCHLESWIG. The capital of the Province of Schleswig-Holstein, Prussia, at the west end of the Schlei, 87 miles by rail north by west of Hamburg (Map: Germany, C 1). It consists

chiefly of a single semicircular street and is divided into Friedrichsberg, Lollfuss, and the Altstadt. Its principal structures are the twelfth-century Romanesque cathedral, restored in the Gothic style in 1440 and 1894, containing an oak shrine with 398 carved figures; St. Michael's Church (1100); and the church and palace of Gottorp. The industries are fishing, the manufacture of leather and machinery, and the shipping of coal, cereals, and lumber. Schleswig is first mentioned in 804 as Sliestorp. It was made the seat of a bishopric in 948 and received municipal privileges in the twelfth century. It was the residence of the Danish Governor of Schleswig-Holstein from 1731 to 1846. In 1866 it passed to Prussia. Pop., 1900, 17,909; 1910, 19,905.

SCHLESWIG-HOLSTEIN, hōl'stīn. A province of Prussia (Map: Germany, C 1). The former duchies of Schleswig and Holstein constitute the northern and southern halves respectively. Its area is about 7340 square miles, including Helgoland. The surface is generally flat. The eastern coast land, which is indented by several deep and narrow fiords (excellent natural harbors), and which is more elevated than the western, contains most of the agricultural land of the province. The interior is chiefly moorland, a continuation of the Lüneburg heath on the south. The soil along the western coast consists of marshy but fertile marine alluvium, and the land is here so low that it has to be protected from the sea by dikes. The west coast is also lined by a series of sandy islands inclosing shallow lagoons, which are in great part dry at low tide. The principal rivers flow into the North Sea. The Elbe forms the southern boundary of the province, and the Eider separates the former duchies of Schleswig and Holstein. The province is traversed by several canals, the most important of which is the Kaiser Wilhelm Canal, connecting the North Sea with the Baltic.

Agriculture is the chief occupation of the province. The production of wheat, rye, oats, barley, potatoes, hay, beets, etc., is considerable. Schleswig-Holstein has long been famous for its excellent cattle, which are exported all over the world for breeding purposes. Horses are also extensively raised.

Manufacturing industries are little developed. Metal ware and some machinery are produced, and there are several textile mills, shipyards, sugar refineries, distilleries, etc. The advantageous position of the province between the North Sea and the Baltic has contributed largely to its commercial development, which is much greater than the natural resources of the province would warrant. The shipping is very considerable in the three chief ports of Altona, Flensburg, and Kiel, the last being also the chief naval station of Germany. In the Prussian Landtag the province is represented by 19 members in the Lower and 11 in the Upper Chamber. It returns 10 members to the German Reichstag. Pop., 1900, 1,387,968; 1910, 1,621,004, almost wholly Protestant. In 1900 there were 132,000 Danes. Danish is still the predominating language in the northern districts. The largest cities are Kiel and Altona; capital, Schleswig.

History. Schleswig was annexed to the German Kingdom in the tenth century and was constituted a so-called mark. The region was obtained by the Danish King Knut (Canute) from the Emperor Conrad II in 1027, and for a long time it was administered as a separate sovereignty by members of the Danish royal house. In the course of the thirteenth century Schleswig was transformed into an hereditary duchy, which remained a fief of Denmark. In 1375 Schleswig passed into the possession of the counts of Holstein of the house of Rendsburg. Margaret of Denmark confirmed this union by a treaty in 1386, Schleswig continuing as before a Danish fief, with a provision that it should never be incorporated with Denmark. In 1460, after the extinction of the Rendsburg line, Schleswig and Holstein placed themselves under the rule of Christian I of Denmark, of the house of Oldenburg. This union was in the nature of a dynastic one merely, and it was stipulated that Schleswig and Holstein should never be separated from each other. As ruler of Holstein the King of Denmark became a member of the Germanic body. In 1474 Holstein was erected from a county into a duchy. The Danes always regarded Schleswig as Danish, and the mass of the people were until recently Danish. Under the house of Oldenburg the nobility became more and more Germanized. By the beginning of the nineteenth century the German population had become as numerous as the Danish. Holstein had at an early period become completely Germanized.

After the Napoleonic wars the King of Denmark entered the Diet of the German Confederation as Duke of Holstein. King Christian VIII, who ascended the throne in 1839, made it the chief aim of his policy to bring Schleswig-Holstein into a closer union with Denmark and to put an end to the peculiar form of dependence existing between the duchies and the rest of the monarchy. The popular sentiment in Denmark demanded that Schleswig at least be made an integral part of the Danish realm. In 1846 the King aroused great indignation in the duchies, where the Salic law of succession was held to obtain, by issuing a letter patent in which he declared that in Schleswig, as well as in a part of Holstein, the succession would be regulated in the same manner as in Denmark. The importance of this declaration was increased by the fact that the early extinction of the Oldenburg line was anticipated. Christian VIII died in January, 1848, and was succeeded by Frederick VII, the last of his dynasty, who announced his intention of incorporating Schleswig with Denmark. Thereupon the people of Schleswig-Holstein, aroused by the news of the February revolution in France, rose in rebellion and appealed to their German brethren for aid. Germany was now in a state of revolution, and troops were dispatched by Prussia and other states, which, with the Schleswig-Holstein forces, drove the Danes beyond the frontiers of Schleswig. Frederick William IV of Prussia, who had engaged reluctantly in the contest with the hopes of appeasing the revolutionary party at home by taking up the cause of a liberal movement and who was influenced by the hostile attitude of Russia and England towards the Schleswig-Holsteiners, concluded the armistice of Malmö in August, 1848. In 1849 Denmark ventured to renew the struggle. Her forces were repeatedly defeated, but in 1850 Prussia definitely abandoned the cause of Schleswig-Holstein, and the patriots were allowed to succumb to the superior strength of the Danes. At the beginning of 1851 Prussia and Austria intervened in favor of Denmark, and the Schleswig-

Holsteiners were compelled to lay down their arms. The European Powers in the London Conference of 1852 upheld the claims of Denmark in regard to Schleswig and provided for the succession of Prince Christian of Glücksburg to the Danish throne in case of the extinction of the royal line. On the death of Frederick VII in 1863 without heirs, Prince Frederick of Augustenburg put forward the claims of his house to the succession in Schleswig-Holstein under the Salic law, disregarding a renunciation made by his father, Christian of Augustenburg, in 1852, and asked the German Diet to declare the London protocol of no force. He was at once hailed as their lawful sovereign by the people of the duchies. Christian of Glücksburg, succeeding to the Danish throne as Christian IX, was compelled by Danish public sentiment to ratify the fundamental constitution for Denmark and Schleswig. The German Diet supported the claims of Augustenburg and declared a federal execution in favor of Holstein, sending federal troops there. At the close of 1863 a ducal government was established at Kiel under the Prince of Augustenburg.

Schleswig-Holstein now became a pawn in the great game which Bismarck was playing for the unification of Germany. (See BISMARCK; GERMANY.) Bismarck easily induced Austria to coöperate with Prussia in the affairs of the duchies. The German Diet was asked by the two Powers to demand the withdrawal of the Danish constitution, and, when the Diet refused to interfere in the affairs of Schleswig, Austria and Prussia made the demand themselves as an ultimatum, and upon the refusal of Denmark they at once began hostilities. Denmark hoped to resist long enough to secure intervention by other Powers, but neither France, England, nor Russia was inclined to interfere. In February, 1864, the allied forces advanced into Schleswig. The outnumbered Danes were forced back from one line of defense to another, and Christian IX was compelled to accept humiliating terms of peace, embodied in the Treaty of Vienna of Oct. 30, 1864. Schleswig, Holstein, and Lauenburg were ceded to Austria and Prussia. By the terms of the Convention of Gastein, Aug. 14, 1865, the provisional government of Schleswig was assumed by Prussia and that of Holstein by Austria, Prussia purchasing Austria's right in Lauenburg. The other German states and the Prussian people vainly objected to these high-handed proceedings of the governments of Berlin and Vienna. The military occupancy of the two duchies by the rival Powers soon brought out their essential hostility. Austria finally placed the affairs of Holstein before the Diet of the German Confederation, whereupon Prussia charged her rival with a violation of the Gastein agreement and the Prussian troops entered Holstein, which the Austrians abandoned, throwing the whole question into the Diet (June, 1866). This was the immediate occasion of the Seven Weeks' War (q.v.), which was followed by the formal incorporation of Schleswig-Holstein with Prussia.

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SCHLETTSTADT, shlĕt'stät. A town of Alsace-Lorraine, Germany, on the Ill, 27 miles south-southwest of Strassburg (Map: Germany, B 4). The thirteenth-century Gothic minster is one of the finest in Alsace. The eleventh-century church of St. Fides is also interesting. The town has a normal school and a public library. The principal industries are the making of wire rope, tanning, and lumbering. Schlettstadt was a free Imperial city in the Middle Ages. It was captured by the French in 1634 and strongly fortified. Pop., 1900, 9336; 1910, 9905.

SCHLEY, slī, WINFIELD SCOTT (1839–1911). An American naval officer, born at Richfields, near Frederick, Md., Oct. 9, 1839. He graduated at the United States Naval Academy in 1860 and as midshipman on the *Niagara* went on a cruise to China and Japan in 1860–61 and was promoted to the rank of lieutenant in 1862. After the outbreak of the Civil War he served on the *Winona* with the West Gulf blockading squadron. Subsequently he was attached to the *Monongahela* and *Richmond* and took part in all the engagements preceding the capture of Port Hudson. From 1864 to 1866 he was executive officer of the *Wateree* of the Pacific squadron, attaining the rank of lieutenant commander in the latter year. He was an instructor at the Naval Academy from 1866 to 1869 and in 1870 was assigned to the *Benicia* on the China station, where he remained three years, and distinguished himself in the capture of the Korean forts on the Salee River in June, 1871. In 1874 he was promoted to the rank of commander and was again detailed as an instructor at the Naval Academy. From 1876 to 1879 he commanded the *Essex* on the Brazil station. In 1884 he commanded the third naval expedition sent by the United States government to the relief of Lieut. A. W. Greely (q.v.) and after passing through 1400 miles of ice found Greely and the six survivors of his band at Cape Sabine, Grinnell Land. From 1885 to 1889 Schley was chief of the Bureau of Recruiting and Equipment and in 1888 attained the rank of captain. In 1889–91 he commanded the cruiser *Baltimore* in the South Pacific. After several years' service as a lighthouse inspector he was placed in command of the *New York* in 1895 and in 1897–98 was chairman of the Lighthouse Board. He reached the rank of commodore in February, 1898, and after the formal declaration of war against Spain, although the lowest on the list of commodores, was placed in command of the Flying Squadron.

On May 13 he sailed southward from Hampton Roads in order to find and if possible destroy the Spanish fleet of Admiral Cervera. He touched at Cienfuegos and after considerable hesitation and delay established the blockade of Santiago, in whose harbor it was finally ascertained on May 29 that the Spanish fleet lay. At the beginning of June Admiral Sampson (q.v.) arrived with his ships and assumed command. The blockade was maintained until the morning of the 3d of July, when the attempt of the Spanish squadron to escape from the harbor ended in its complete destruction by the American blockading squadron, which, during the temporary absence of Sampson, was under the command of Schley. The *Brooklyn*, with Commodore Schley on board, bore a conspicuous part in the contest, particularly in the pursuit and destruction of the *Cristóbal Colón*, but a peculiar "loop" movement which Schley ordered and which blanketed the fire of some of the other battleships and caused the *Texas* to deviate from her course in order to escape being run down, caused much adverse criticism. On August 10 he became a rear admiral and was appointed a member of the commission to arrange for the evacuation of Porto Rico by the Spanish. He retired from active service Oct. 9, 1901. After the close of the war his conduct during the operations leading up to the battle off Santiago and in the battle itself became the subjects of criticism, both official and unofficial, to such an extent that Schley finally asked for a court of inquiry to investigate the charges brought against him. A court consisting of Admiral Dewey (president), and Rear Admirals Benham and Ramsay, sat from Sept. 21 to Nov. 7, 1901, took the testimony of more than 75 witnesses, and on December 13 made its report. The majority report, signed by all three members, found that, while Schley's conduct in the battle showed personal courage, in the operations prior to June 1 it was marked by "vacillation, dilatoriness, and lack of enterprise," that he was slow to obey express commands of his commander in chief, that his dispatches were "inaccurate and misleading," and that his "loop" movement in the battle of July 3 was unseamanlike and unnecessary. Admiral Dewey presented a minority report, upholding Schley in some minor respects. The recommendation of the court that no action be taken was approved by the President. Schley died Oct. 2, 1911. With J. R. Soley (q.v.) he wrote *The Rescue of Greely* (1886) and *Forty-five Years under the Flag* (1904).

SCHLICH, shlĭk, Sir William (1840–). A British authority on forestry. He was born in Flonheim, Darmstadt, and was educated at the University of Giessen. In 1866 he entered the Indian Forest Department and in 1871 became conservator and in 1881 inspector general of forests. He was the pioneer of scientific forestry in England, organizing in 1885 a school at Cooper's Hill, transferred in 1905 to Oxford, where he became professor of forestry. His great work was *A Manual of Forestry* (5 vols., 1889–96), with W. R. Fisher.

SCHLIEMANN, shlē'mân, Heinrich (1822–90). A famous German archæologist, born in Neu-Buckow, Mecklenburg-Schwerin. From the age of 12 to 14 he studied in the Realschule in Neustrelitz and then became apprentice as grocer's clerk in Fürstenberg. After five years his health broke down, and he walked to Hamburg, where he shipped for South America as cabin boy. The vessel was wrecked, but Schliemann was saved and taken to Amsterdam. Here he held a humble position in a commercial house, but by his industry acquired a knowledge of all the important modern languages. In 1847 he embarked in business on his own account. For the next 16 years he was successful in business, traveled much, and by mere chance on July 4, 1850, being present in California at the time that State was received into the Union, became a citizen of the United States. He finally retired from business with a large fortune in 1863. He then settled in Paris and gave himself up entirely to archæological studies. In 1868 he visited Corfu, Ithaca, the Peloponnesus, and Asia Minor, and finally, in 1870, began excavations in the Troad on the hill of Hissarlik, where he believed the remains of ancient Troy would be discovered. (See Troy.) The excavations were continued by him for 12 years and finally completed by W. Dörpfeld (q.v.) in 1892. The excavations which he began at Hissarlik were the first of a long series of undertakings by him which have given us new knowledge of the early Greek civilization. From 1876 to 1878 he carried on excavations at Mycenæ (q.v.) and in 1878 at Mount Athos (q.v.) and on the island of Ithaca (q.v.). In 1881–82 he excavated at Orchomenus (q.v.); he continued the work there in 1886. In 1884–85 he laid bare the ruins of the great palace at Tiryns (q.v.), and in 1889 he returned to Troy. He died at Naples and is buried near the Ilissus at Athens. His publications include: *Ithaka, der Peloponnes und Troja* (1869); *Trojanische Altertümer* (1874); *Mykenä* (1878; Eng. ed., New York, 1878); *Ilios* (1881; Eng. ed., New York, 1881); *Orchomenos* (1881); *Troja* (in an Eng. ed., New York, 1883; Ger. ed., Leipzig, 1884). His autobiography was edited by his wife (Leipzig, 1891). Consult Schuchardt, *Schliemanns Ausgrabungen in Troja, Tiryns, Mykenä, Orchomenos, Ithaka* (2d ed., Leipzig, 1891), translated under the title *Schliemann's Excavations and Archæological and Historical Studies* (London, 1891); J. E. Sandys, *A History of Classical Scholarship*, vol. iii (Cambridge, 1908); C. H. and H. Hawes, *Crete: the Forerunner of Greece*, 3–7 (London, 1909).

SCHLIK, shlĭk, Franz, Count von (1789–1862). An Austrian cavalry general, born in Prague. In the campaign of 1813–14 he took a prominent part, winning the rank of major. In 1844 he had become field-marshal lieutenant, and in the winter of 1848 he was ordered into Upper Hungary at the head of a corps of only 8000 men, with which he at first carried on a successful campaign against a superior force, but was soon forced to retreat. He joined Windischgrätz's forces and contributed to the victory of Kápolna. In the Italian campaign he commanded the second Austrian army (1859), which formed the right wing at Solferino.

SCHLITZ, shlĭts, Johann Eustach von Görtz, Count von (1737–1821). A Prussian diplomat, born at Schlitz and educated at the University of Strassburg. In 1778 he went as the secret agent of Frederick II of Prussia to Munich and Zweibrücken, with the special mission of preventing the cession of Lower Bavaria to Austria after the death of Maximilian Joseph. In 1779–85 he was Ambassador to Russia and rendered important services, though

he failed to prevent Russia's withdrawal from her alliance with Prussia. After the death of Frederick II he went to the Netherlands for the purpose of reconciling the Stadtholder's government and the democratic party. From 1788 to 1806 he was the Prussian representative at the Imperial Diet at Regensburg. He took part in the peace congress held at Rastatt in 1797–99 and served as a member of the Imperial commission formed to execute the provisions of the Treaty of Lunéville (1801). He resigned from the state service after the Treaty of Tilsit (1807). His writings include: *Mémoires ou précis historique sur la neutralité armée* (1801); *Mémoires et actes authentiques relatifs aux négociations qui ont précédé le partage de la Pologne* (1810); *Mémoire historique de la négociation en 1778* (1812). His posthumous *Historische und politische Denkwürdigkeiten* were published in 1827–28.

SCHLÖMILCH, shlĕ'mĭlk, Oskar (1823–1901). A German mathematician, born in Weimar. He studied at Jena, Berlin, and Vienna, became privatdocent at Jena in 1844 and two years later assistant professor. In 1849 he was called to the Polytechnic Institute at Dresden as professor of higher mathematics and analytical mechanics. He was widely known as editor (from 1856) of the *Zeitschrift für Mathematik und Physik* (Leipzig), usually called *Schlömilchs Zeitschrift*. He wrote: *Handbuch der algebraischen Analysis* (6th ed., 1881); *Analytische Studien* (1848); *Compendium der höhern Analysis* (1853); *Uebungsbuch zum Studium der höhern Analysis* (4th ed., 1888); *Grundzüge einer wissenschaftlichen Darstellung der Geometrie des Masses* (7th ed., 1888); *Analytische Geometrie des Raumes* (last ed., 1898). Consult *Zeitschrift für Mathematik*, vol. xlvi (Leipzig, 1901), with portrait.

SCHLOSSER, shlŏs'sĕr, Friedrich Christoph (1776–1861). A German historian, born at Jever, Oldenburg. He studied at Göttingen, was for several years a private tutor, then a librarian in Frankfort, and in 1817 was called to Heidelberg as professor of history. His most notable works are the *Geschichte des 18. Jahrhunderts*, continued by Schlosser in the later editions till the fall of Napoleon, and the *Weltgeschichte für das Deutsche Volk;* both have been translated into English and other tongues. Schlosser's historical writing was done from the ethical rather than the severely critical point of view and has enjoyed considerable popularity.

SCHLÖZER, shlĕt'sĕr, August Ludwig von (1735–1809). A German historian, born at Gaggstadt. He studied theology and the Oriental languages at Wittenberg and Göttingen, went to Stockholm and Upsala in 1755, and returned to Göttingen in 1759, to study music. From 1761 to 1769 he was in St. Petersburg and then became professor at Göttingen. The most important of his works are: *Allgemeine nordische Geschichte* (1772); *Weltgeschichte im Auszuge und Zusammenhange* (1792 and 1901) and *Vorbereitung zur Weltgeschichte für Kinder* (6th ed., 1806), with both of which he did pioneer work by a more intelligent and spirited treatment of universal history; also his *Staatsanzeigen* (18 vols., Göttingen, 1783–93). Consult Zermelo, *August Ludwig Schlözer* (Berlin, 1875).

SCHLÖZER, Kurd von (1822–94). A German diplomat and historian, born in Lübeck and educated at Göttingen, Bonn, and Berlin. He entered the Prussian diplomatic service and became Secretary of Legation at St. Petersburg in 1857, at Rome in 1863, Minister of the North-German Confederation in Mexico in 1867, German Minister at Washington in 1871, and in 1882 Prussian Ambassador to the papal court, where he took a prominent part in settling the Kulturkampf. He retired from public life in 1892. Among his works are *Choiseul und seine Zeit* (1848; 2d ed., 1887), *Friedrich der Grosse und Katharina II.* (1859), and several works on the history of the German Baltic provinces.

SCHLUNDT, shlŭnt, Herman (1869–). An American chemist, born at Two Rivers, Wis. He studied at the universities of Wisconsin and Leipzig, receiving his Ph.D. from the former in 1901. He taught chemistry and physics while at Wisconsin and in a high school in Milwaukee, and after 1902 served successively as instructor, assistant professor, and professor of physical chemistry in the University of Missouri. He published many papers on physical chemistry and radioactivity, and the following books: *Radioactivity of the Thermal Waters of Yellowstone National Park* (1910), with R. B. Moore; *Laboratory Experiments in General Chemistry* (1912).

SCHLÜTER, shlŭ'tĕr, Andreas (1664–1714). A German sculptor and architect. He was born in Hamburg, or, according to some authorities, in Danzig, where his father, a sculptor and architect, was much employed. He studied at Danzig under Sapovius and probably traveled in France and Italy. After practicing three years at Warsaw as architect, he was called in 1694 to Berlin, the scene of his chief artistic activity, as court architect. Finally, he lost the favor of Frederick I and spent the last two years of his life in the service of Peter the Great in Russia. Schlüter was influenced by the Dutch, French, and Italian baroque, but he also studied the antique and was singularly free from the superficiality of his age. His work is spirited and truthful and combines architectural and sculptural qualities in a rare degree. His masterpiece in sculpture is the fine equestrian statue of the Great Elector (1703) in Berlin. From 1699 to 1706 he was chief architect of the Royal Palace, for which he designed the north and south façades and much of the interior decoration. Other famous works are the 21 "Masks of Dying Warriors" and other decorations for the Berlin Arsenal, the Charlottenburg Castle, and the mausoleum of Frederick I and his consort. He is reckoned the greatest German sculptor of his day. For his biography, consult Klöden (Berlin, 1855), Adler (ib., 1862), Gurlitt (ib., 1890), and Seidel (ib., 1901).

SCHMALKALDEN, shmäl-käl'den, or **SMALCALD.** A town in the Province of Hesse-Nassau, Prussia, at the confluence of the Stille and the Schmalkalde, 18 miles southwest of Gotha (Map: Germany, D 3). It has been largely modernized, but retains its double walls, ancient courthouse, and castle. Interesting features are the fifteenth-century Gothic church, with a famous organ, and the Luther fountain. There are iron mines and salt baths. The manufactures are chiefly of hardware. Schmalkalden is first mentioned in 874. It is famous as the scene of the formation of the German Protestant League in 1531. Karl Wilhelm, who composed the "Wacht am Rhein," was born here in 1815.

(See SCHMALKALDIC LEAGUE.) Pop., 1900, 8726; 1910, 10,053.

SCHMALKALDIC (shmäl-käl'dĭk) **LEAGUE.** The name given to the defensive alliance organized at Schmalkalden (q.v.), Dec. 31, 1530, by a number of Protestant princes and Imperial cities and formally concluded April 4, 1531. Chief among the organizers of the league were: John the Constant, Elector of Saxony; his son, John Frederick (who succeeded to the electorate in 1532); and Philip, Landgrave of Hesse. The rulers of Saxony and Hesse were empowered to manage its affairs. The object of this alliance, which was soon greatly extended, was the defense of the religion and political freedom of the Protestants against the power of the Emperor Charles V. Against the league the Emperor, engaged as he was at the time in contests with the Turks and French, found himself unable to contend, and in 1532 he was forced to grant the religious Peace of Nuremberg. Finally, however, in 1546, he resolved to turn his guns against the Protestants, and the War of the Schmalkaldic League ensued, in which the Emperor had the support of Maurice, the ambitious Duke of Saxony, of the Albertine line, who was induced to betray the Protestants by the promise of the Electorate of Saxony. The Protestant forces, under John Frederick, were totally routed at Mühlberg (April 24, 1547), and both the Elector and Philip of Hesse fell into the Emperor's hands. This defeat finished the war. The object of the league, the guaranty of the liberty of religion to the Protestants, was subsequently effected by Maurice, then Elector of Saxony, who, having rejoined the Protestants, by a brilliant feat of diplomacy and generalship, compelled the Emperor to grant the Treaty of Passau (Aug. 2, 1552), by which this freedom was secured. See CHARLES V; GERMANY; MAURICE, DUKE AND ELECTOR OF SAXONY; REFORMATION.

SCHMARDA, shmär'dȧ, LUDWIG KARL (1819–1908). An Austrian naturalist and traveler, born at Olmütz, Moravia. He studied in Vienna and in 1850 became professor at the University of Graz, where he founded the Zoölogical Museum, and in 1852 at Prague. In 1853–57 he traveled around the world and in 1862 was appointed professor at the University of Vienna. For the government he investigated the industry of fisheries on the Austrian (1863–65) and French (1868) coasts and, after having retired from service in 1883, visited Spain and the African coast in 1884, 1886, and 1887. His publications include: *Andeutungen aus dem Seelenleben der Thiere* (1846); *Zur Naturgeschichte der Adria* (1852); *Die geographische Verbreitung der Thiere* (1853); *Zur Naturgeschichte Aegyptens* (1854); *Neue wirbellose Thiere* (1859–61); *Reise um die Erde* (1861); and a textbook for higher institutions, entitled *Zoologie* (1871; 2d ed., 1877–78).

SCHMARSOW, smär'zō, AUGUST (1853–). A German art historian. He was born at Schildfeld, Mecklenburg-Schwerin, and was educated in Zurich, Strassburg, and Bonn. He became docent of the history of art at Göttingen in 1881, professor there in 1882, at Breslau in 1886, went to Florence in 1892, and thence to Berlin in 1893. In 1888 he founded the Kunsthistorisches Institute in Florence, an institution to promote original research in the history of Italian art, now a German state institution. His writings are characterized by sound scholarship and acute criticism. He wrote biographies of David D'Angers, Ingres, and Prudhon in Dohme's *Kunst und Künstler; Raphael und Pinturicchio in Siena* (1880); *Melozzo da Forlì* (1886); *Giovanni Santi* (1887); *St. Martin von Lucca und die Anfänge der toskanischen Sculptur im Mittelalter* (1889); *Masaccio-Studien* (1895–99), with atlas; *Barock und Rokoko* (1897); *Grundbegriffe der Kunstwissenschaft* (1905); *Federigo Barocci* (1909–10); *Gherardo Starnina* (1912).

SCHMAUK, shmouk, THEODORE EMANUEL (1860–). An American Lutheran theologian and editor, born at Lancaster, Pa. He graduated at the University of Pennsylvania (1883) and went as pastor to Lebanon, Pa. He became editor in chief of the *Lutheran Church Review* (1895) and editor of other publications of his church. In 1903 he was elected president of the General Council of the Evangelical Lutheran Church in North America, and in 1911 accepted the chair of Christian Faith and Apologetics at the Lutheran Theological Seminary, Philadelphia. His writings include: *The Negative Criticism of the Old Testament* (1894); *Manual of Bible Geography* (1901); *History of the Lutheran Church in Pennsylvania* (1903); *Account of the German Inhabitants of Pennsylvania* (1910); *Christianity and Christian Union* (1913).

SCHMEKS, shmēks. See TÁTRAFÜRED.

SCHMELLER, shmĕl'lĕr, JOHANN ANDREAS (1785–1852). A German philologist. He was born at Tirschenreuth, Bavaria, and studied at Munich. In 1821 he published *Die Mundarten Bayerns* (supplemented by a lexicon, 4 vols., 1827–36; 2d ed. by Frommen, 1868–77). From 1828 until his death he taught in the University of Munich. Schmeller edited the *Hêliand* (1830); the *Evangelienharmonie* (1841); the *Muspilli* (1832); *Lateinische Gedichte des 10. und 11. Jahrhunderts* (1838), with Jakob Grimm; *Carmina Burana* (1847; 3d ed., 1894); and Hadamar von Laber's *Jagd* (1850). His *Cimbrisches Wörterbuch* was edited by Bergmann in 1855. Consult Nicklas, *Schmellers Leben und Wirken* (Munich, 1885), and Hoffmann, *J. A. Schmeller* (ib., 1885).

SCHMERLING, shmĕr'ling, ANTON, KNIGHT VON (1805–93). An Austrian statesman, born in Vienna. As an opponent of Metternich's policy he was sent to represent Austria at the Frankfort Parliament and presided over it after the retirement of Colloredo. Elected to the German National Assembly, he advocated a constitutional monarchy and was appointed Minister of Foreign Affairs and of the Interior by the Vice Regent, Archduke John. Prussian influence having prevailed against his efforts to uphold the Austrian hegemony, he retired and in Vienna entered Schwarzenberg's cabinet as Minister of Justice, in which capacity he introduced trial by jury. At variance with the reactionary policy of Prince Schwarzenberg, he resigned in 1851, but soon afterward became chairman of the Senate of the Supreme Court, and in 1858 president of the Provincial Court of Appeals. The popular opposition to the federal October diploma of 1860 led to the appointment of Schmerling as Minister of State to promote the transformation of Austria into a constitutional monarchy, but his failure to overcome the opposition of the Hungarian Diet to his measures forced him to resign in 1865, whereupon he was appointed president of the Supreme

Court. In 1867 he was made a life member of the House of Lords, where he repeatedly acted as First Vice President, and after 1879 led the party in opposition to the policy of Count Taaffe. For his biography, consult Arneth (Vienna, 1895).

SCHMID, shmīt, CHRISTOPH VON (1768–1854). A German writer of juvenile works, born at Dinkelsbühl. His principal juveniles, which were very popular and were translated into French and English, are *Biblische Geschichte für Kinder, Der Weihnachtsabend, Genoveva, Ostereier, Das Blumenkörbchen,* and *Erzählungen für Kinder und Kinderfreunde* (1823–29). His autobiography, *Erinnerungen aus meinem Leben,* was published in 1853–57.

SCHMID, HERMANN VON (1815–80). A German novelist and dramatist, born at Weizenkirchen, Austria, and educated at Munich. In 1870 he became manager of the Gärtnerthor Theatre in Munich, but resigned the position after a few years. His plays, collected in 1853, include several historical dramas, such as *Karl Stuart* and *Columbus,* but his greater success was in portraying peasant life, as in *Die Z'widerwurz'n* (1878) and *Der Tatzelwurm* (1880). In his novels, too, such as *Almenrausch und Edelweiss, Der Habermeister,* etc., he is at his best when describing Bavarian customs. His collected works appeared in 50 volumes (Leipzig, 1873–84).

SCHMID, WILHELM (1859–). A German classical scholar, born at Künzelsau. After study at the universities of Tübingen and Strassburg he taught at Tübingen (1887 et seq.) and became professor there in 1893. His publications include: *Kulturgeschichtliche Zusammenhang und Bedeutung der griechischen Renaissance in der Römerzeit* (1898); *Zur Geschichte des griechischen Dithyrambus* (1901); *Verzeichniss der griechischen Handschriften der Königlichen Universitäts-Bibliothek Tübingen* (1902); revisions of W. Christ, *Geschichte der griechischen Litteratur* (vol. i, 5th ed., Munich, 1908; 6th ed., part i, 1912; vol. ii, 5th ed., ib., 1911–13).

SCHMIDT, shmīt, ERICH (1853–1913). A German historian of literature, born at Jena, son of Oskar Schmidt. He studied Germanic philology and literary history at Graz, Jena, and Strassburg, established himself as privatdocent at Würzburg in 1875, became professor at Strassburg in 1877, at Vienna in 1880, and director of the Goethe-Archiv at Weimar in 1885. Thence he was called to Berlin in 1887, to succeed Wilhelm Scherer in the chair of German language and literature. Devoted almost exclusively to the investigation of modern German literature, especially of the classical period, he published: *Richardson, Rousseau, und Goethe* (1875); *Lenz und Klinger* (1878); *Heinrich Leopold Wagner* (2d ed., 1879); *Beiträge zur Kenntnis der klopstockschen Jugendlyrik* (1880); *Charakteristiken* (1st series 1886, 2d series 1900; 2d ed., 1902, 1912); and an excellent biography of *Lessing* (3d ed., 1910). Among other works he edited two volumes of the *Schriften der Goethe-Gesellschaft* (Weimar, 1886 and 1893), and *Faust,* for the Weimar edition; and in 1887 he published *Goethe's Faust in ursprünglicher Gestalt* (6th ed., 1905), discovered by him in Dresden.

SCHMIDT, FRIEDRICH, BARON (1825–91). A Viennese architect, born at Frickenhofen, Württemberg. He studied in the Polytechnic at Stuttgart, worked as a mason on the cathedral at Cologne, was called to the Milan Academy as professor in 1857, and was awarded the commission to restore the church of Sant' Ambrogio. In 1859 he settled in Vienna, was appointed professor at the Academy in 1860, architect of St. Stephen's in 1863, and was made Baron in 1888. His principal buildings in Vienna among others are the church at Fünfhaus (1864–74) and the new city hall (1872–83), his most imposing work. He was an eminent exponent of the Gothic style.

SCHMIDT, GEORG FRIEDRICH (1712–75). A German engraver, etcher, and designer. He was born in Schönelinde, near Berlin, and studied there under Busch and then in Paris under Larmessin. He rapidly attained success with his plates after Rigaud and was received at the Academy in 1742. In 1744 he was appointed engraver to Frederick II, in Berlin, and in 1757 he was summoned to St. Petersburg by the Empress Elizabeth to engrave her portrait and to organize a school of engraving. Schmidt possessed great skill, facility, and feeling for color, and, though lacking in freedom, he is one of the greatest German line engravers of the eighteenth century. He also etched 25 plates after Rembrandt which are inferior to his engravings. Among the most celebrated of the latter are: "The Empress Elizabeth" and "Count Nicholas Eszterházy," both after Tocqué; "Pierre Mignard" and the "Comte d'Evreux," both after Rigaud; "Frederick the Great," after Pesne. He also illustrated the writings of Frederick the Great. Consult Wassily, *Kritische Verzeichnisse* (Hamburg, 1887).

SCHMIDT, HENRY IMMANUEL (1806–89). An American clergyman and educator. He was born at Nazareth, Pa., and was educated at the Moravian Academy and Theological Seminary of his native place. He joined the Lutheran denomination in 1829, held several pastorates, taught in several institutions, and from 1848 to 1880 was professor of the German language and literature at Columbia College. He was the author of a *History of Education* (1842; 10th ed., 1858); *The Scriptural Character of the Lutheran Doctrine of the Lord's Supper* (1852); *Course of Ancient Geography* (1860).

SCHMIDT, JOHANN FRIEDRICH JULIUS (1825–84). A German astronomer, born in Eutin. He was employed in the Hamburg Observatory (1842–45) and for a short time at a private observatory at Bilk. He became assistant observer at Bonn (1846), observer at Olmütz (1853), and director of the observatory at Athens (1858), where he remained till his death. He studied the physical nature of comets and of the moon, the brightness and periodicity of stars, and physical geography, especially that of Greece. Besides his contributions to the *Astronomische Nachrichten* and to the *Publications de l'observatoire d'Athènes* he published a revision of Lohrmann's chart of the moon (1877) and a very valuable independent chart (1878), and wrote: *Das Zodiakallicht* (1856); *Der Mond* (1856); *Vulkanstudien* (1874); *Studien über Erdbeben* (1875).

SCHMIDT, JOHANN KASPAR. See STIRNER, MAX.

SCHMIDT, JOHANNES (1843–1901). A German philologist, born at Prenzlau, Prussia, and educated at Bonn and Jena. In 1868 he obtained a position as docent in comparative philology at Bonn and became assistant pro-

fessor in 1873. Soon after he was called to the professorship at Graz and in 1876 went to Berlin, where he remained until his death. His first important contribution was his wave theory with reference to the relationship of the Indo-Germanic languages. (See PHILOLOGY.) The best known of his numerous works are: *Zur Geschichte des indogermanischen Vokalismus* (2 vols., Vienna, 1871–75); *Die Verwandtschaftsverhältnisse der indogermanischen Sprachen* (ib., 1872); *Die Pluralbildungen der indogermanischen Neutra* (ib., 1889); *Die Urheimat der Indogermanen und das europäische Zahlensystem* (Berlin, 1890); *Kritik der Sonantentheorie* (Vienna, 1895). He was associate editor of the *Zeitschrift für vergleichende Sprachforschung* from 1875 until his death. Consult Zimmer, *Gedächtnissrede auf J. Schmidt* (Berlin, 1902).

SCHMIDT, JULIAN (1818–86). An eminent German historian of literature, born at Marienwerder, West Prussia. He studied history and philology at Königsberg, taught in Berlin from 1842 to 1846, and went to Leipzig in 1847 as contributor to the *Grenzboten*, which he owned and edited, conjointly with Gustav Freytag, from 1848 to 1861. Returning to Berlin, he conducted for two years the *Berliner Allgemeine Zeitung*, then confined himself to the field of literary history. His first work of importance was the *Geschichte der Romantik im Zeitalter der Revolution und Restauration* (1847). His numerous critical articles for the *Grenzboten* formed the basis for his *Geschichte der deutschen Nationallitteratur im 19. Jahrhundert* (1853; 5th ed., revised and enlarged, under the title *Geschichte der deutschen Litteratur seit Lessings Tod*, 1865–67). Into this was subsequently incorporated his *Geschichte des geistigen Lebens in Deutschland von Leibniz bis auf Lessings Tod* (1860–64), and both works appeared combined as *Geschichte der deutschen Litteratur von Leibniz bis auf unsere Zeit* (1886–96). Noteworthy are also *Geschichte der französischen Litteratur seit der Revolution 1789* (2d ed., 1873–74), *Uebersicht der englischen Litteratur im 19. Jahrhundert* (1859), *Schiller und seine Zeitgenossen* (1859), and the collections of ingenious essays *Bilder aus dem geistigen Leben unserer Zeit* (1870–74) and *Proträts aus dem 19. Jahrhundert* (1878). Julian Schmidt exercised more influence upon the period of German intellectual life in which he worked than has been accorded him. His discussions comprised the entire scope of intellectual life in science, arts, and politics. The forte of his criticism, especially in regard to works of art, lay in an almost infallible instinct to perceive truth, power, and sterling worth.

SCHMIDT, KARL (1812–95). An Alsatian Lutheran theologian. He was born, educated, and died in Strassburg and was professor of theology in the university from 1837 to 1877. He wrote, in French and German, numerous excellent works, of which may be mentioned his biographical studies of Gerson, Tauler, Roussel, Vermigli, Farel, Viret, Melanchthon, Nicolas of Basel, and of the German and other mediæval mystics. His *Essai historique sur la société civile dans le monde romain et sur sa transformation par le christianisme* (1853) was translated into English under the title *The Social Result of Early Christianity* (London, 1885).

SCHMIDT, KARL (1868–). A German Orientalist and biblical scholar, born in Hagenow, Mecklenburg. He was educated at Leipzig and Berlin, became docent at the latter university in 1899, and in 1901 was made a scientific official of the Berlin Academy of Sciences. His important work was in early Christian and particularly Gnostic literature in Coptic. With Harnack he edited *Texte und Untersuchungen* and with Schubart *Altchristliche Texte* (1910). He wrote: *Gnostische Schriften in koptischer Sprache aus dem Codex Brucianus* (1892); *Plotins Stellung zum Gnostizismus* (1901); *Fragmente einer Schrift des Märtyrerbischofs Petrus von Alexandrien* (1901); *Die alten Petrusakten* (1903); *Acta Pauli aus der Heidelberger koptischen Papyrushandschrift* (1904)—Schmidt discovered this Coptic version in 1897; *Koptisch-gnostische Schriften* (1905); *Der erste Clemensbrief in altkoptischer Uebersetzung* (1908).

SCHMIDT, or **WALDSCHMIDT,** MAXIMILIAN (1832–). A German novelist and humorist, born at Eschlkam, Bavaria. He served with distinction in the Bavarian army from 1850 to 1872, when he retired and settled at Munich to devote himself exclusively to his literary work. Among the best of his numerous tales and novels, dealing vividly and realistically with the people and scenery of the Bavarian Forest and Upper Bavaria, should be mentioned: *Volkserzählungen aus dem bayrischen Wald* (1863–69); *Der Schutzgeist von Oberammergau* (1880); *'s Austragsstüberl; Der Georgithaler* (1882); *Die Fischerrosl von St. Heinrich* (1884); *Der Musikant von Tegernsee* (1886); *'s Lisel von Ammersee* (1887); *Die künischen Freibauern* (1895). Gradually these productions fell off in literary merit as the author became more and more prolific. Lasting success attended his *Humoresken* (1892), the collection of dialect poems *Altboarisch* (1884), and several popular plays, dramatized from his novels. He also published *Meine Wanderung durch 70 Jahre* (1902) and *Die Wanderungen Zum Achtziger* (1912), both autobiographical. His *Gesammelte Werke* appeared in a popular edition of 32 volumes (Reutlingen, 1898–1905).

SCHMIDT, NATHANIEL (1862–). An American Orientalist, born at Hudiksvall, Sweden, and educated at the Gymnasium of his native town, Colgate University, and the University of Berlin. He was professor of Semitic languages and literatures at Colgate University from 1888 to 1896 and thenceforth at Cornell. He was director of the American School for Oriental Study and Research in Palestine in 1904–05 and in the latter year undertook a complete circumnavigation of the Dead Sea (q.v.). In 1914 he served as president of the Society of Biblical Literature and Exegesis. Among his publications are: *Biblical Criticism and Theological Belief* (1897); *Outlines of a History of India* (1902); *Outlines of a History of Syria* (1902); *Ecclesiasticus* (1903); *The Prophet of Nazareth* (1905; 2d ed., 1907); *The Original Language of the Parables of Enoch* (1908); *The Messages of the Poets* (1911). He also contributed to the *Encyclopædia Biblica*, the *Jewish Encyclopædia*, and the NEW INTERNATIONAL ENCYCLOPÆDIA.

SCHMIDT, OSKAR (1823–86). A German zoölogist, born at Torgau. After studying at Halle and Berlin he began to lecture on zoölogy at Jena in 1846, became assistant professor there in 1849, and professor successively at Cracow (1855), Graz (1857), and Strassburg

(1872). His reputation is based upon the handbook of comparative anatomy (1849), the 9th edition of which (1882) formed the basis of Lang's *Lehrbuch der vergleichenden Anatomie der wirbellosen Tiere* (1888–94). He also wrote a *Lehrbuch der Zoologie* (1853) and for advanced classes *Leitfaden der Zoologie* (1860; 4th ed., 1882). From 1860 he devoted himself more especially to the investigation of Spongiæ and published on this subject several treatises. His other writings include: *Goethes Verhältnis zu den organischen Naturwissenschaften* (1853); *Das Alter der Menschheit und das Paradies* (1866), with Franz Unger; *Descendenzlehre und Darwinismus* (1873; 3d ed., 1884); *Die Säugethiere in ihrem Verhältnis zur Vorwelt* (1884; Eng. trans., 1885).

SCHMIDT, Otto Ernst (pseudonym, Otto Ernst) (1862–). A German author. He was born in Ottensen, near Hamburg, the son of poor parents. After teaching for 18 years he turned to literature. He first appeared as a poet with two volumes of lyrics, *Gedichte* (1888; 4th ed., 1911) and *Neue Gedichte* (1892). Among his dramas may be mentioned: *Die grösste Sünde* (1895; 4th ed., 1901); *Jugend von heute* (1899; 12th ed., 1906); *Flachsmann als Erzieher* (1901; 30th ed., 1912); *Die Gerechtigkeit* (1902); *Bannermann* (1904). Among his novels and tales the best known are: *Kartäusergeschichten* (1895); *Hamborger Schippergeschichten* (1899; 8th ed., 1909); *Asmus Sempers Jugendland* (1904; 85th ed., 1912); *Appelschnut* (1906). Of his later works the following may be noted: *Semper der Jüngling* (1907), a novel; *Tartüff, der Patriot* (1908), a comedy; *Die Liebe hört nimmer auf* (1911), a drama; *St. Yoricks Glockenspiel* (1913). His best work is in the field of the short story and humorous sketch. Consult Schumann, *Otto Ernst* (1903).

SCHMIDT, Wilhelm Adolf (1812–87). A prominent German historian, born in Berlin, where he studied history and philology and in 1839 established himself as lecturer. In 1845 he became professor there, in 1851 at Zurich, and in 1860 at Jena. As a member of the Reichstag in 1874–76 he belonged to the National Liberal party. His more important works include: *Geschichte der Denk- und Glaubensfreiheit im ersten Jahrhundert der Kaiserherrschaft und des Christentums* (1847); *Zeitgenössische Geschichten: I. Frankreich von 1815 bis 1830, II. Oesterreich von 1830 bis 1848* (1859); *Preussens deutsche Politik* (3d ed., 1867); *Tableaux de la révolution française publiés sur les papiers inédits du département de la police secrète de Paris* (1867–71); *Elsass und Lothringen* (3d ed., 1870); *Pariser Zustände während der Revolutionszeit 1789–1800* (1874–76); *Das Perikleische Zeitalter* (1877–79); *Abhandlungen zur alten Geschichte* (1888). He edited the 8th issue of Becker's *Weltgeschichte* (22 vols., Leipzig, 1874–79). Consult Landwehr, *Zur Erinnerung an Adolf Schmidt* (Berlin, 1887).

SCHMIDTLEIN, shmĭt'līn, Jakob. A German theologian. See Andreæ, Jakob.

SCHMIDT-RIMPLER, rĭm'plēr, Hermann (1838–). A German ophthalmologist, born in Berlin and educated there. He served as army surgeon in the Prussian wars of 1864, 1866, and 1870–71, resigning in 1871. After acting as clinical assistant to Gräfe from 1868 to 1871 he went to Marburg as professor of ophthalmology. In 1890 he was appointed to a chair at Göttingen and in 1901 to one at Halle. Schmidt-Rimpler called attention to the relation between the diseases of the eye and the organism in *Erkrankungen des Auges im Zusammenhang mit andern Krankheiten* (1898; 2d ed., 1905). He also published: *Ueber Blindsein* (1882); *Augenheilkunde und Ophthalmoskopie* (1885; 7th ed., 1901; Eng. translation, ed. by I. B. St. John Roosa, *Ophthalmology and Ophthalmoscopy*, 1889); *Die Schulkurzsichtigkeit und ihre Bekämpfung* (1890).

SCHMIEDEL, shmē'del, Paul Wilhelm (1851–). A German New Testament scholar, born at Zaukeroda. He was educated at the universities of Leipzig and Jena, studied theology, became professor of theology in 1890 at Jena, and in 1893 went to the University of Zurich. To the *Hand-kommentar* on the New Testament he contributed a commentary on Corinthians and Thessalonians (1891; 2d ed., 1892) and to the *Encyclopædia Biblica* several articles, notably the classic statement of the Tübingen theory that the story of Simon Magus was intended merely to shield Paul from the charge of appropriating money. He revised Winer's grammar of New Testament Greek (1894) and wrote two important books which appeared in English versions, *Jesus in Modern Criticism* (1907; in German, 1906) and *The Johannine Writings* (1908; in German, 1906).

SCHMITZ, Eugene F. (?–). An American politician, born in San Francisco. Early an orchestra leader at the Columbia Theatre, San Francisco, he was the mayoralty candidate of the new Union Labor party in 1900 and was reëlected in 1903 and again in 1905. An investigation of charges of corruption against Schmitz and Abe Ruef (q.v.) resulted in a sensational trial in 1907. Schmitz was convicted of extortion, but the verdict was set aside on a technicality. For a time there was an overwhelming popular sentiment against him, but by 1915 he was able to poll nearly one-third of the votes cast for mayor of San Francisco. See California, *History*, and consult the articles on California in the New International Year Book for 1907 and 1908.

SCHMOLLER, shmŏl'lēr, Gustav von (1838–). A German economist and historian, born at Heilbronn. He studied at Tübingen, in 1864 became professor extraordinary, and in 1865 professor ordinary at Halle. In 1872 he was called to the University of Strassburg and in 1882 to the University of Berlin, which he represented (after 1899) in the Prussian House of Lords. At a comparatively early age Schmoller gained a reputation as a leader of the historical school of economics. His works, the majority of which deal with industrial history, include: *Strassburg zur Zeit der Zunftkämpfe* (1875); *Zur Litteraturgeschichte der Staats- und Sozialwissenschaften* (1888); *Umrisse und Untersuchungen zur Verfassungs-, Verwaltungs-, und Wirtschaftsgeschichte* (1898); *Grundriss der allgemeinen Volkswirthschaftslehre* (1900); *Ueber einige Grundfragen der Sozialpolitik* (1904); etc. After 1881 Schmoller was editor of the *Jahrbuch für Gesetzgebung, Verwaltung, und Volkswirthschaft im deutschen Reich*. From 1878 to 1903 he edited a series of monographs entitled *Staats- und sozialwissenschaftliche Forschungen*. To *Acta Borussia*, the publication of which was undertaken by the Berlin Academy of Science upon Schmoller's

and Sybel's instigation, Schmoller contributed many essays.

SCHMUCKER, shmŭk'ĕr, BEALE MELANCHTHON (1827–88). An American Lutheran theologian, best known for his liturgical and hymnological labors. He was born at Gettysburg, Pa., and studied there in college and in the theological seminary. He collected a valuable liturgical library. With Mann and Germann he edited the American revision of the *Hallesche Nachrichten.* Schmucker founded many Lutheran schools and took a prominent part in the preparation of the common service now in use in the Lutheran church.

SCHMUCKER, or **SMUCKER,** SAMUEL MOSHEIM (1823–63). An American historical writer. He was born at New Market, Va., graduated at Washington College in Pennsylvania in 1840, became a Lutheran minister, was admitted to the bar in 1850, and devoted most of his later years to writing. His publications include: *Life of John C. Frémont, with his Explorations* (1856); *Life and Times of Alexander Hamilton* (1856); *Life and Times of Thomas Jefferson* (1857); *The Yankee Slave-Driver* (1857); *Life of Dr. Elisha Kent Kane and Other American Explorers* (1858); *Life and Times of Henry Clay* (1859); *Blue Laws of Connecticut* (1860); *History of the Modern Jews* (1860); and the first volume of *A History of the Civil War in the United States* (1863).

SCHMUCKER, SAMUEL SIMON (1799–1873). An American Lutheran divine. He was born at Hagerstown, Md., graduated at the University of Pennsylvania (1819), studied in Princeton Theological Seminary, and was ordained a Lutheran minister (1821). He became professor of didactic theology and chairman of the faculty in Gettysburg Theological Seminary (1826–64). He was the leader of the low-church Lutheran party who are connected with the General Synod and was better known outside of his communion than any other Lutheran minister. Of his numerous publications may be mentioned: *Fraternal Appeal to the American Churches on Christian Union* (1838), which prepared the way for the formation of the Evangelical Alliance; *The American Lutheran Church* (1851); *The Lutheran Symbols* (1856); *The Church of the Redeemer as Developed within the General Synod of the Evangelical Lutheran Church* (1870). Consult H. E. Jacobs, *The Lutherans,* vol. iv, in "American Church History Series" (New York, 1893).

SCHNAASE, shnä'ze, KARL (1798–1875). A distinguished German art historian and jurist. With Rumohr, Waagen, and Kugler, he was one of the founders of modern art history, who conceived art in its connection with the universal, cultural, and intellectual life. Born at Danzig, he began the study of law in 1816 and matriculated at Heidelberg also under Hegel whom he followed to Berlin. In 1848 he was appointed councilor at the Supreme Court in Berlin, but resigned in 1857 to confine himself to his studies. With Grüneisen and Schnorr he founded in 1858 the *Christliches Kunstblatt,* sojourned in Rome in 1865–66, and settled at Wiesbaden in 1867. As an author he made himself first known by his *Niederländische Briefe* (1834), which was followed by numerous minor treatises and essays. His principal work, however, is the *Geschichte der bildenden Künste* (7 vols., 1843–64; 2d ed., 8 vols., 1865–79), which interprets art history as an integral part of the history of civilization. Consult his biography by Lübke (Stuttgart, 1879).

SCHNABEL, shnä'bel, JOHANN GOTTFRIED (c.1690–c.1750). A German author, who was known under the pseudonym of Gisander. During a part of his career he was in the service of Count Stolberg, but very few other facts concerning him are known. He wrote some of the best "Robinsonaden," or imitations of *Robinson Crusoe,* that appeared in German, such as *Wunderliche Fata einiger Seefahrer* (1731–43), *Die Inseln im Südmeere* (republished, 1826), and the famous *Die Insel Felsenburg* in four volumes (between 1731 and 1743; republished, 1827).

SCHNARS-ALQUIST, shnärs'-äl'kvĭst, HUGO (1855–). A German marine painter. He was born in Hamburg and, after several years in business, studied painting under Gude in Berlin. Later, during extended voyages, he made a special study of the ocean, which he depicts with great truthfulness in all its phases. He is represented in the Hamburg, St. Louis, and Melbourne galleries and in private collections in America, Germany, and Australia. He was a member of the jury at the Chicago and Melbourne expositions and at the latter received the great gold medal.

SCHNECKENBURGER, shnĕk'en-bur'gĕr, MAX (1819–49). A German poet, born in Thalheim, Württemberg. He was partner in an iron foundry at Burgdorf, near Bern. His best-known poem, *Die Wacht am Rhein,* although composed in 1840, did not become famous until the outbreak of the Franco-Prussian War. It was set to music by Karl Wilhelm.

SCHNEEBERG, shnā'bĕrk. A town in the Kingdom of Saxony, Germany, 19 miles by rail southeast of Zwickau (Map: Germany, E 3). Mining and lace making are the main industries. Cobalt, bismuth, and nickel are chiefly mined. The Schneeberger brand of snuff is well known. The late Gothic church contains a fine crucifixion by Cranach the Elder. Pop., 1900, 8752; 1910, 9663.

SCHNEIDEMÜHL, shnī'de-mul. A town of the Province of Posen, Prussia, 153 miles by rail northeast of Berlin (Map: Germany, G 2). The town has handsome churches, a Catholic seminary, and a provincial deaf and dumb asylum. There are important glass works. Pop., 1900, 19,655; 1910, 26,106, mostly Roman Catholics.

SCHNEIDER, shnī'dĕr, CHARLES CONRAD (1843–). An American engineer, born at Apolda, Saxony. He graduated from the Royal Technical School at Chemnitz, Germany, in 1864, and became a draftsman for the Rogers Locomotive Works at Paterson, N. J., in 1867. After 1870 he was engaged primarily in bridge construction; during the period 1876–86 designed and constructed several long-span bridges, of which the most notable are the Fraser River (cantilever) Bridge on the Canadian Pacific Railway (1882) and the Niagara Cantilever Bridge (1883); was vice president of the American Bridge Company in 1900–03 and after 1911 served as a member of the board of engineers for the Quebec Bridge. In 1905 Schneider held the presidency of the American Society of Civil Engineers. He is author of *General Specifications for Railroad Bridges* (1886); *General Specifications for Highway Bridges* (1901); *General Specifications for Structural Steel Work in Buildings* (1905; rev. ed., 1910).

SCHNEIDER, FRIEDRICH (1786–1853). A

German composer, born at Alt-Waltersdorf, Saxony. He attended the Zittau Gymnasium and later the Leipzig University. In 1821 he was called to Dessau as court kapellmeister, having become famous the year previous by the production of his great oratorio, *Das Weltgericht*. While at Dessau he did much towards perfecting the court orchestra, conducted the Singakademie, established the Liedertafel, and founded a school of music in 1829, which flourished until 1854. He was a pioneer in the establishment of the modern music festival (q.v.). Among his works are the oratorios *Die Sündflut*, *Christus der Meister*, *Pharao*, *Gethsemane und Golgotha*, and *Absalom*. He also wrote masses, motets, pianoforte and violin music, symphonies, and songs.

SCHNEIDER, Johann Gottlob (1750–1822). A German classical scholar, born in Saxony and educated at the universities of Leipzig and Göttingen. In 1776 he was appointed professor of ancient languages and history at the University of Frankfort-on-the-Oder, and in 1811, when the university was moved to Breslau, he went there as university librarian. He published many editions of the classical writers, particularly those relating to natural history, including the works of Ælian, Nicander, the *Scriptores Rei Rusticæ*, Xenophon, Vitruvius, Aristotle's *Politics*, *Natural History*, *Economics*, *Physics*, etc. His critical *Griechisch-deutsches Wörterbuch* (2 vols., Züllich, 1797–98; 3d ed., Leipzig, 1819–21) was the best Greek lexicon since that of H. Stephanus (q.v.) (1572) and formed the basis of all later Greek lexicons. Consult J. E. Sandys, *A History of Classical Scholarship*, vol. ii (Cambridge, 1908).

SCHNEIDER, Louis (1805–78). A German actor and author, born in Berlin, the son of a musical conductor, whom he accompanied on his tours until in 1820 he secured an engagement at the Royal Theatre in Berlin. For 28 years a great favorite as a comedian there, he wrote several plays and operettas, the most successful of which were *Der Heiratsantrag auf Helgoland*, *Der Schauspieldirektor*, and *Der Kurmärker und die Picarde*. When in 1848 he retired to Potsdam, Frederick William IV appointed him his reader and made him an aulic councilor, in which capacity he continued under William I. During the campaigns of 1866 and 1870–71 he accompanied the headquarters of the army as reporter for the *Staats-Anzeiger*. Besides the historical novel *Der böse Blick* (2d ed., 1871), he published: *Geschichte der Oper und des königlichen Opernhauses in Berlin* (1852); *König Wilhelm* (1869); *Kaiser Wilhelm, 1867–71* (1875). Two works appeared posthumously and aroused great interest: *Aus meinem Leben* (1879–80) and *Aus dem Leben Kaiser Wilhelms* (1888).

SCHNEIDEWIN, shnī'de-vĭn, Friedrich Wilhelm (1810–56). A German classical scholar. He was born at Helmstedt and was educated at Göttingen, where he was professor of classical literature from 1837 until his death. His works include: *Delectus Poësis Græcorum Elegiacæ, Iambicæ, Melicæ* (1838–39), which for the first time gave the fragments of Greek lyric poetry in convenient form; *Beiträge zur Kritik der Poëtæ Lyrici Græci* (1844); Martial's *Epigrammata*, with critical commentary (1842; text, 1853 and 1866); and Sophocles, with critical commentary (7 vols., 1849–54, frequently reëdited by A. Nauck), an important work. After 1846 he edited the well-known *Philologus*, which he had founded. Consult J. E. Sandys, *A History of Classical Scholarship*, vol. iii (Cambridge, 1908).

SCHNITZER, shnĭts'ĕr, Eduard. See Emin Pasha.

SCHNITZER, Germaine Alice (1888–). A French-American pianist, born in Paris. She received her musical education at the Conservatory in Paris and the Meisterschule in Vienna, carrying off several first prizes at both institutions. Her début occurred at Berlin in 1905. After a series of European successes she appeared in the United States in 1909 and met with so much favor that she settled there permanently. In 1913 she was married to Dr. Leo Buerger, of New York.

SCHNITZLER, shnĭts'lĕr, Arthur (1862–). An Austrian dramatist, son of Johann Schnitzler. He was born in Vienna, May 15, 1862, studied medicine, and took his degree (1885) in his native city. There also he was on the staff of the Imperial General Hospital from 1886 to 1888 and practiced medicine privately. Turning to literature, he published *Anatol* (1893), a "sequence of dialogues"—seven one-act dramas—presenting a graceful and accurate, if erotic, picture of modern Viennese life. This was followed by *Liebelei* (1895); *Der grüne Kakadu* (1899), three one-act dramas in the same vein; *Paracelsus* (1899); *Die Gefährtin* (1899); *Lebendige Stunden* (1902, 1906), containing the excellent one-act play *Literatur*, presented in New York in 1915; *Marionetten* (1906); *Das Vermächtnis* (1901); *Freiwild* (1895); *Das Märchen* (1902); and the more ambitious dramas *Der Schleier der Beatrice* (1901); *Der Ruf des Lebens* (1905); *Der einsame Weg* (1904); *Zwischenspiel* (1906); *Comtesse Mizzi* (1909); *Der junge Medardus* (1910); *Das weite Land* (1911); *Professor Bernhardi* (1913). *Reigen* (1910) is a collection of erotic dialogues upon a very risqué subject. Among his narrative works may be mentioned: *Sterben* (1895); *Leutnant Gustl* (1901); *Die griechische Tänzerin* (1905); *Der Weg ins Freie* (1908); *Masken und Wunder* (1912); and *Frau Beate und ihr Sohn* (1913). Some of these went through many editions. The following are to be had in English: *Anatol* (1911), played in the United States in 1912; *Professor Bernhardi* (1913); *The Green Cockatoo and Other Plays* (1913); *Playing with Love* (1914); *The Lonely Way, Intermezzo, Countess Mizzi* (1915). Schnitzler's field is the one-act play, the short story, and the sketch. He is distinctly Viennese and smartly modern. Although he possesses the technical skill of a genuine dramatist, yet nowhere does he reach the depth of a great artist. Perhaps his best dramatic work is seen in *Der grüne Kakadu* and *Der einsame Weg*. In 1912 his *Gesammelte Werke* were published in Berlin in seven volumes. Consult: Theodor Reik, *Arthur Schnitzler als Psycholog* (Minden, 1913); H. B. Samuel, *Modernities* (London, 1913); J. G. Huneker, *Ivory, Apes, and Peacocks* (New York, 1915); Ludwig Lewisohn, *The Modern Drama* (ib., 1915).

SCHNORR VON CAROLSFELD, shnôr fôn kä'rôls-fĕlt, Julius (1794–1872). A German historical and religious painter. He was born at Leipzig, where he received his first instruction from his father, the painter Johann Veit Schnorr (1764–1841). He afterward studied in the Acad-

emy at Vienna, from which he seceded with the group of painters headed by Overbeck, going to Rome in 1818. (See PRE-RAPHAELITES.) His share in their joint commission to decorate the Villa Massimi was a fresco of Orlando Furioso, his principal work at Rome. In 1827 he was appointed professor in the Academy of Munich and commissioned by King Louis I to decorate five rooms of the Königsbau with frescoes from the Nibelungenlied, and three rooms in the Festsaalbau with encaustic paintings of subjects from the history of Charlemagne, Frederick Barbarossa, and Rudolph of Hapsburg. In 1846 he was made professor in the Academy and director of the picture gallery at Dresden. Schnorr's painting shows the general characteristics of the Nazarite Brotherhood (see OVERBECK; PRE-RAPHAELITES), except that it is less extreme in both spirit and technical methods. His best and most popular work, however, is the series of 240 vigorous drawings for the *Bibel in Bildern* (Picture Bible, 1851–60). Examples of his easel paintings are in the galleries at Berlin and Dresden. Consult the monograph by Singer (Bielefeld, 1911).

SCHNORR VON CAROLSFELD, LUDWIG (1836–65). A German tenor, born at Munich. Having received his musical education at the Leipzig Conservatory and under E. Devrient in Karlsruhe, he made his début in Méhul's *Joseph* (1858). In 1860 he was engaged at the Dresden Opera. Wagner regarded him as the greatest dramatic singer he had ever met, and chose him to create the part of Tristan (1865). At the same time his wife, Malvina Garrigues (1825–1904), created the part of Isolde. Subsequently she sang at Dresden, Hamburg, and Karlsruhe, and after her retirement was in great demand as a teacher. Consult R. Wagner, "Meine Erinnerungen an Ludwig Schnorr von Carolsfeld," in his *Gesammelte Schriften und Dichtungen*, vol. viii (Leipzig, 1888).

SCHOBERT, shō'bĕrt, JOHANN (?–1767). A German composer, born in Silesia. From about 1760 till his death, at Paris, he was chamber cembalist to Prince Conti. His compositions, consisting chiefly of sonatas, chamber symphonies, and concertos, are important both for originality and as examples of the early instrumental style perfected by Haydn and Mozart (qq.v.). See MUSIC, HISTORY OF, *XIX*.

SCHOELCHER, shĕl'shâr', VICTOR (1804–93). A French politician, born in Paris. He is chiefly known as an advocate of the abolition of slavery in the French colonies. With a view to studying all the aspects of the question, he traveled in Mexico, Cuba, and the United States in 1829. In 1848, as Undersecretary for the Navy, he secured the passage of a law abolishing slavery in the French colonies. He was a member of the Constituent Assembly and of the National Assembly from 1848 to 1850 and voted with the Extreme Left. Expelled from France after the coup d'état of Dec. 2, 1851, he remained in England till the fall of the Second Empire, when he returned, and during the siege of Paris commanded the artillery of the National Guard. Among his writings are an English *Life of Handel* (1857); *Des colonies françaises, Abolition immédiate de l'esclavage* (1842); *La famille, la propriété et le christianisme* (1837); *Le vrai Saint-Paul* (1879); *Vie de Toussaint Louverture* (1889).

SCHÖFFER, shĕf'ĕr, PETER (c.1425–c.1503). An early German printer. He was born at Gernsheim and in early life was a copyist in Paris. About 1450 he became an assistant in the printing establishment of Gutenberg and Fust at Mainz. After the retirement of the former he became Fust's partner and with him printed the *Psalter* of 1457, the oldest type printing with an authentic printed date. He is said to have introduced many improvements in the art of printing and usually shares with Gutenberg and Fust the honor of the discovery of the method of casting metal types. He married the daughter of Fust.

SCHOFIELD, skō'fēld, JOHN MCALLISTER (1831–1906). An American soldier, born in Chautauqua Co., N. Y. He graduated at West Point in 1853, was assistant professor of natural and experimental philosophy there from 1855 to 1860, and was then for a time professor of physics at Washington University, St. Louis, Mo. On the breaking out of the Civil War he became major of the First Missouri Volunteers, served as chief of staff for General Lyon during the operations in Missouri, and took part in the battles of Dug Spring and Wilson's Creek. Afterward as brigadier general of volunteers he commanded the State troops and the District of St. Louis, until placed in command of the Army of the Frontier in 1862. In November, 1862, he was promoted to the rank of major general of volunteers. In 1864 he was assigned to the command of the Army of the Ohio. In Sherman's campaign in Georgia he commanded the Twenty-third Corps. He received his appointment as brigadier general in the regular army for his services at the battle of Franklin (q.v.), Nov. 30, 1864, in which he defeated the Confederates under General Hood. With his command he was transferred to North Carolina and was appointed to the command of that department. On Feb. 22, 1865, he occupied Wilmington, fought the battle of Kinston (March 8–10), and joined Sherman at Goldsboro (March 22, 1865). He was Secretary of War ad interim from May, 1868, to March, 1869; was then placed in command successively of the Department of the Missouri and of the Division of the Pacific. In July, 1876, he was appointed superintendent of the United States Military Academy and from 1882 to 1883 had command of the military Division of the Pacific. He then commanded successively the divisions of the Missouri and of the Atlantic and was commanding general of the United States army from 1888 to 1895, when he retired with the rank of lieutenant general. He published *Forty-Six Years in the Army* (New York, 1897).

SCHOFIELD, WALTER ELMER (1867–). An American landscape painter. He was born in Philadelphia. After studying at the Pennsylvania Academy of Fine Arts he went to Paris, where he was trained under Bouguereau, Ferrier, and Ducet and with Aman-Jean. He also worked independently for three years at St. Ives. With characteristic energy and perseverance Schofield applied himself to the rendering of snow scenes with little streams or rivers. His treatment is broad and virile, with good draftsmanship, excellent composition, and careful massing of detail. Although the color scheme is somewhat restricted, the flat decorative effect obtained is pleasing. Good examples of his work are to be found in most public collections in America. The Metropolitan Museum, New York, possesses "Sand Dunes near Lelant"; the Cincinnati Art Museum, "Midwinter Thaw, Morn-

ing"; the Corcoran Art Gallery, Washington, "Morning after Snow"; the Carnegie Institute, Pittsburgh, "Across the River." In 1907 Schofield became a member of the National Academy of Design, where he received the first Hallgarten prize in 1901 and a gold medal in 1911. He received gold medals also at the Pennsylvania Academy of Fine Arts (1903) and at the Carnegie Institute, Pittsburgh (1904), and a medal of honor at the Panama-Pacific Exposition (1915), and was elected to the National Institute of Arts and Letters.

SCHOFIELD, WILLIAM HENRY (1870–). An American English scholar. He was born at Brockville, Ontario, graduated A.B. from Victoria College of the University of Toronto in 1889, and continued his studies at Harvard (A.M., 1893; Ph.D., 1895), where, after two years of study and travel in Europe, he was instructor (1897–1902) and assistant professor (1902–06) of English, and professor and head of the department of comparative literature after 1906. He lectured at Paris and Copenhagen in 1911 and served as exchange professor at Berlin in 1907–08. Schofield was editor in chief of *Harvard Studies in Comparative Literature.* His publications include: *Studies on the Libeaus Desconus* (1895); *The Home of the Eddic Poems* (1899); *English Literature from the Norman Conquest to Chaucer* (1905); *Chivalry in English Literature* (1912).

SCHO'LA CANTO'RUM. See CONSERVATORY; INDY, P. M. T. V. D'.

SCHO'LAS'TICISM (from Lat. *scholasticus,* Gk. *σχολαστικός, scholastikos,* relating to school, learned, from *σχολή, scholē,* learning, leisure, school). A term applied in its commonest acceptation to the teaching of those who devoted themselves in the mediæval schools to the sciences, especially philosophy and theology. Not only the latter branches, but the whole speculative science of the Middle Ages, is sometimes included under the term "scholasticism." This, however, is obviously an exaggeration, since mediæval speculation ran in such markedly diverging channels as the Arabian, Jewish, and Greek philosophies, while against the current of genuine scholasticism there were all along two directly antischolastic movements—pure rationalism and mysticism. Again, scholasticism is not unfrequently made to stand for a method of demonstration chiefly characterized by fideism, apriorism, logomachy, endless subtlety, and hair-splitting, whose sole organ is supposed to be the deductive syllogism. This interpretation, however, is justified only as regards the method of its adherents of inferior rank and of its formative and declining periods.

Scholasticism is essentially a *Weltanschauung,* a synthetic view of the universe, embracing the world, man, and God with their interrelations, in so far as this is attainable by the aid of experience, reason, and revelation coöperating. It is thus, subjectively, one of the efforts of the human mind to obtain a unified comprehension of reality. Objectively and in its developed form scholasticism is a systematized result of this striving for unity, an orderly synthetic view of reality.

Among the peculiarities which on the whole differentiate it from other world views the following especially deserve attention. 1. The completeness of its criteria, and consequently of the materials which, resulting from their coördination, combine in its composition. Consciousness, sense experience, intellectual intuition, reasoning, inductive and deductive demonstration, human testimony conjoin in it with divine revelation in the endeavor to ascertain the ultimate nature of the reality that presents itself to the mind. Sense experience and the inductive process were, it is true, inadequately and uncritically employed by the mediæval scholastics, but this defect has been made good by their modern successors. 2. Its method combines analysis with synthesis, induction with deduction—a union which, harmonizing the process of inquiry and proof with man's dual nature, can alone, it is asserted, engender intellectual perfection. 3. The continuity of its evolution. The beginnings of scholasticism are traced historically to Socrates, the results of whose search for the permanent element in the contingent, the universal in the particular, were developed by Plato. The Platonic system was pruned of its idealistic excrescences and its extremely dualistic view of human nature by Aristotle. Into the Greek synthesis St. Augustine built many of the conceptions derived from Christian revelation, and, thus enlarged and interpreted, it passed through the more immediately formative stages of the earlier Middle Ages and through the hands of St. Anselm, to receive a mature development in the thirteenth century under the influence of St. Thomas Aquinas. Then followed the age of decline and arrested progress. In the second half of the nineteenth century it came forth in renewed vigor and has since been assimilating to its organism the results of philosophical criticism and empirical research. The scholastic synthesis is therefore the outcome of a rational eclecticism on independent and original lines.

Its philosophical content is mainly derived from Aristotle, though in following him the schoolmen were by no means servile. Other systems—Platonism, Neoplatonism, Stoicism, Pythagoreanism, as well as the philosophical speculations of the fathers—enter into its body. Its theological content is the truths of revelation as gleaned from the Bible, ecclesiastical tradition, and the authoritative pronouncements of the Church. Scholasticism has also been defined as the application of Aristotle to theology, or the expression of the facts and realities of revelation in the mind language of the Peripatetics. The definition is true so far as it goes, but is inadequate. The inference, however, should not be drawn that the Catholic church has committed herself to Aristotle's philosophy. She makes use of it, indeed, as a standard of expression, but she indorses none of its tenets that are not necessarily accepted by plain common sense; for, like every other philosophy, it contains elements implicated in the very nature of the mind, combined with other peculiar debatable features which are the product of human ingenuity.

History of the Scholastic Movement. The more immediate history of mediæval scholasticism may be divided into four periods: (1) the formative period, reaching from the ninth to the closing of the twelfth century; (2) the period of maturity; (3) the period of decline; (4) the subsequent stage culminating in what is known as neoscholasticism of the present day. Two distinct currents run through the history of mediæval speculation—the strictly scholastic and the mystical. Indications of the divergence of these two streams are noticeable in the patristic period, but the distinction became broad and deep in the Middle Ages. Scholasticism repre-

sents the speculative, mysticism the contemplative, phase of thought. Scholasticism strives to comprehend truth by the investigations of reason; mysticism by the methods of contemplation, by the sympathies and emotions of the heart. The two schools, however, were at one in their reverence for Christian truths, and, whatever their differences on other points, they supplemented each other's teaching and, on the whole, so counterbalanced one another as to prevent either from pushing its doctrine to a dangerous extreme.

During the first period the broader outlines of the scholastic synthesis were gradually laid. The first attempts were vast accumulations of raw material, general cyclopedias or summaries of the intellectual possessions of the age, like the *Origines* of Isidore of Seville, the *De Natura Rerum of Bede*, and the *De Universo* of Rhabanus Maurus. Gradually the special philosophical problems differentiate themselves, and the broken threads of the ancient and patristic traditions are gathered up. The dominant subject of study was dialectic, and the question of the nature of universals, with which the period may properly be said to have opened, mainly absorbed attention. There speedily developed a ridiculous despotism of formal logic, mainly due to the wrong philosophical orientation of the early schoolmen owing principally to their meagre supply of philosophical literature. The earlier scholastics drew their doctrines from conflicting sources. Mutilating one author, misunderstanding another, ignoring in all the historical and logical relation, they elaborated irregular systems without always knowing how to escape inconsistency. In dialectics Aristotle held undisputed sway. Metaphysics was a bizarre union of Aristotelian and Platonic ideas. From the *Timæus* was borrowed the theory of the principle of causality, from Aristotle the scheme of the four causes. The Platonic doctrine of ideas was brought to the front together with the Aristotelian theories of substance, nature, person, and the categories. Indirectly, through St. Ambrose and Boëthius, the composition of matter and form was known, though this organic doctrine of the Peripatetics plays but an insignificant part and was always misunderstood. Cosmological teachings show the same uncertainty. Under the influence of the Platonic theory of the world soul, or the *fatum* of the Stoics, an autonomous life was attributed to nature, though, on the other hand, some of the ablest of the schoolmen (Abélard, John of Salisbury) maintained with Aristotle the individuality of every natural substance, two theses that it is impossible to reconcile.

Up to the thirteenth century the psychology of the schools is principally Augustinian and Platonic. Man is a microcosm, a mirror of the universe. From St. Augustine is taken the division of faculties and the theory of knowledge. To these studies on the psychical activities were united observations on the empirical and physiological life, inspired by Arabian science. On the nature of man whatever concerned the origin and destiny of the soul was eagerly studied. The relation between body and soul was explained on the Platonic theory—the soul being held to be united to the body as the pilot to the ship, the rider to his horse. Theodicy was always considered as one of the most important chapters in scholastic philosophy. The fathers of the Church, the pseudo-Dionysius, and Boëthius had left long dissertations on the existence of God; therein are found the Aristotelian ideas on the prime mover, the Neoplatonic conceptions of the demiurge, of a Supreme Being, and the Pythagorean traditions on number. On the whole, if we except theodicy, which, fragmentary though it was, remained faithful to the true genius of scholasticism, in the philosophy of this period the effort to amalgamate heterogeneous and incompatible elements was the chief defect.

The scholastic movement reaches its fullest mediæval development in the thirteenth century with the great teachers of the age, Albertus Magnus, St. Thomas Aquinas, St. Bonaventura, and Duns Scotus. Its dominant traits are now: 1. Comprehensiveness. Acquainted with all the problems suggested by a complete philosophical system, the scholastics offer definite solutions ready for unitive coördination. 2. Individuality of the philosophers. The thirteenth century was a century of individualities. While all the great schoolmen agreed in a number of fundamental theories, each of them imprinted upon this common fund the mark of his personality. 3. The prominence given to psychological and metaphysical problems. In psychology, the genesis of knowledge and the nature of the soul; in metaphysics, the theories of matter and form, of the nature and of the origin of substances, of the principle of individuation sum up the main subjects of controversy.

The intensity of Christian faith among the contemporaries and successors of Charlemagne explains the ingress of scholastic philosophy upon the domain of theology. The dispute concerning predestination raised the problem of liberty and its relation to God's providence and justice; the controversy of Paschasius on the Eucharistic Presence occasioned dissertations on substance and accident. The dogma of the Trinity suggested discussions on the concepts of nature, individuality, person; the mystery of transubstantiation and of the divine simplicity provoked the study of physical processes. However, before long the philosophical questions were disengaged from their theological setting. Distinction between the two sciences was deduced from the diversity of their principles, their methods, and their special objects—a distinction which is explicitly laid down and developed in the first question of the *Summa Theologiæ* by St. Thomas.

The decline of scholasticism followed rapidly on its maturity. The causes which led to its ruin acted slowly but steadily. Of these causes some are internal, the exhaustion of the movement itself; others external, the decline of studies, and the progressive encroachments of antischolastic philosophies. Lack of originality is the first symptom of this decay. From the fourteenth century the number of those who devoted themselves to the study of philosophy grew in colossal proportions. Universities multiplied, and thus facilitated the growth of philosophical pursuits. Entire orders engaged in the prevalent controversies. But these multitudinous philosophers no longer thought for themselves. They enrolled themselves with some great school, led by some illustrious thinker. As with all the writers of periods of decline, they were mere commentators upon the thoughts of others.

As schools increased, individuality decreased. The thirteenth century was marked by distinct personalities; the fourteenth and fifteenth were periods of impersonal thought. Apart from the

Terminists the schoolmen after the thirteenth century discovered no new modes of speculation. But terminism was a symptom of decay, for in its work is noticeable another mark of decomposition which was not slow to invade all scholasticism, the deterioration in the scholastic synthesis. The new theories—those of Occam, e.g. —were at ill accord in more than one point with the scholastic synthesis, without, however, being in conflict with its organic principles. The passionate disputes of the Terminists, Scotists, and Thomists also largely contributed to disturb the economy of scholasticism.

Scholasticism itself departed further and further from the dignified and precise language of the thirteenth century. Uncouth expressions which hitherto had appeared only sporadically and for the most part in Arabo-Latin translations multiplied rapidly from the fourteenth century; even the spelling in use with professors betrayed an unpardonable ignorance of Latin. Terminism and Scotism must assume the greater part of the responsibility for this decadence. And as defect in form engenders confusion of ideas, there appears also a deterioration in scholastic methods. Under pretext of clarity, distinctions, subdistinctions, terms, and counterterms were multiplied. These abuses were furthered by the progressive advance of an exaggerated dialectic. The thirteenth century looked upon dialectics in theory and practice as a mental discipline preparatory to the study of physics, metaphysics, and morals. The altering of this relation inevitably led to the despotism of formalism. There were some symptoms of this intellectual malady at the beginning of the fourteenth century; it progressed gradually until it had undermined the vitality of scholasticism.

Mental enervation became apparent in the intellectual centres of the time—the religious orders and the universities. The former remained for the time the principal nurseries of science, but zeal for study lessened as discipline relaxed. Among the many teachers eager for quick results there were comparatively few who by personal and persevering effort rose above the prevailing mediocrity. The University of Paris fell rapidly from its grandeur, and scholasticism, which had risen with it, was dragged down in its fall. Yielding to intrigue, the faculty of theology trifled with academic rules; they facilitated the "actus scholastici," shortened the years of study, and made examinations matters of form. The faculty of arts fell into a like condition and thus brought on its own ruin. The arts being an obligatory stage to theology, men with money and ambition had an obvious interest in abridging their study as much as possible.

While scholasticism as a movement was passing through these days of storm and stress, its synthesis was preserved intact. Men of mental breadth and insight like Cajetan (1496–1534), Franciscus Sylvestris Ferrariensis (1474–1528), Bañez (1528–1604), Vásquez (1551–1604), Toletus (1532–1596), and, above all, Suárez (1548–1617) preserved and developed the scholastic organism.

During the nineteenth century philosophers like Kleutgen and Stöckl in Germany; Ozanam, De Broglie, Farges, Blanc, Gardair, and many others in France; Liberatore, Sanseverino, Cornoldi, and Zigliara in Italy; Balmes and Cortés in Spain; Ward and Harper in England, have been bearers of the scholastic teachings to the present age. A strong impulse to the neoscholastic movement was given by Leo XIII in many public utterances, notably by his encyclical *Æterni Patris* (1879), in which he urges a return to the study of the great schoolmen, especially St. Thomas, not, indeed, with a view to a wholesale reimportation of scholasticism in its full mediæval content, but with an eye to its extension, completion, and adaptation to the intellectual requirements and modes of thought of the present age. A valuable aid in this direction is the critical edition of the works of St. Thomas now being published at Rome under the papal auspices. The establishment at Louvain of the Institut Supérieur de Philosophie under the presidency of M. Mercier was also largely due to the broad policy of Leo XIII. A systematic series of works on neoscholasticism emanates from the institute, as does likewise the *Revue Néoscholastique*, a quarterly now in its tenth year. The *Revue de Philosophie* (Paris), the *Philosophisches Jahrbuch* (Fulda), the *Annales de Philosophie Chrétienne* (Paris), and *Divus Thomas* (Piacenza) are among the well-known periodicals devoted to the same movement.

Scholastic Synthesis. So much for the history of scholasticism as a movement. The result, the synthesis, can be here barely touched upon. The scholastic sees the world of reality with the triple eye of sense, reason, and faith. These *organa* are distinct, and each is in its limited sphere independent. They are all necessary to a complete survey of reality and, under normal conditions critically discernible, are mutually corroborative. Under their harmonious interaction the world of reality is seen to embrace Creator and creature, the latter emanating from the former as from its primary archetypal and efficient cause. The irrational world is synthesized in the rational and by it, through a reasonable service, active and passive, referred to its first principle and final end. The method, way, and means to this return of the creature to the Creator is manifest in the synthesis of both, the Incarnate Word and His organized economy. These are the broad lines of the scholastic synthesis.

Separated from the elements derived from revelation, the purely rational lines of the synthesis are the following. It is the aim of philosophy to interpret the universal order of things in its constituent, efficient, and final causes. That order is made up of four departments as manifested under as many ascending degrees of intellectual abstraction: (1) the *real* order, which the mind considers but does not make, and which falls under the scrutiny of physics, mathematics, and metaphysics; (2) the *mental* order, which the mind makes by reflectively considering its own acts, the sphere of logic; (3) the *moral* order, which the mind makes by reflective consideration of the acts of the will, the domain of ethics; (4) the *external* order, which the mind makes in considering man's external productive acts, the order of the arts liberal and mechanical.

The supreme synthetic ideas of the metaphysical order are *act* (perfect determination) and *potency* (determinability). On these rests the distinction between the infinite—whose existence is demonstrated a posteriori—as *actus purus*, unalloyed perfection, and the finite being combining act with potency. The relations of God, the Infinite, to the finite are inferred from His intelligence and will, and are summed up under three:

1. Exemplarism. The divine ideas, or the different phases of God's essence perceived by His intellect as imitable outwardly, are the ultimate ontological basis of all finite realities and the ultimate basis of their cognoscibility and our rational certitude. 2. Creationism. The finite proceeds from the Infinite as the term of the creative act. God's creative efficiency terminates at the very substance of the finite; in this conception the scholastic transcends the Aristotelian concept of the *causa motrix*. 3. Providence. The Creator is necessarily conserver and provider. The finality immanent in creation and directed to an ultimate rational purpose is conceived by the scholastics in a higher and more consistent light than it was by the ancient Greeks.

The mingling of potency and act, the determinable and the determined, shows itself in the finite by a triple composition: (1) that of matter and form; (2) the individual and the general essence; (3) essence and existence. 1. The duality of matter and form was derived from the Aristotelian theory of physical processes and transferred to metaphysics. In the corporeal world everything is constituted of a homogeneous and a heterogeneous principle, of a principle of difference and unity, of passivity and activity. The root of the one is matter, of the other form. Matter cannot subsist without form. The highest forms, the human soul and supernal spirits, can exist without matter. Form is the root of specification; matter, of individuation; but in this capacity matter must be considered in connection with quantitative dimensions. Form is to matter as act to potency. 2. In the finite individual the individuation and the abstract essence are not really, but only virtually distinct. This gives the mind a basis for abstracting the essence—the direct universal (*universale in re*)—and elaborating it by comparison and reflection into the reflex universal (*universale post rem in mente*). The individual is to the essence, the singular to the universal, as act to potency. 3. Essence and existence in the finite are really distinct after the analogy again of act and potency.

Mathematics and physics may be here dismissed. Scholastic physics was based on the Peripatetic and manifests its shortcomings, but together therewith an insight into physical processes and the phenomena of motion which theoretical physics of the present age cannot afford to despise.

Psychology was with the schoolmen, as with Aristotle, a branch of physics, a point of view to which recent physiological psychology has returned. The soul is united to the body as form to matter. The soul is therefore the root of unity and activity in the organism. From it all vital operation—vegetative, sensitive, intellective, appetitive, locomotive—proceeds. The immediate principles of these operations are the powers or faculties, all of which are rooted in the soul, though the senses—the inner and the outer senses and the sensuous appetites—are blended with the chemical matter of the organism, on which they therefore intrinsically and essentially depend. Other powers transcend the material organism as such, and, though dependent thereon for their object matter, operate with a certain autonomy of their own. These intrinsically dependent energies are the intellect and will. Being immaterial, they manifest the immateriality of their root, the substance of the soul. The soul is, therefore, no product of matter. It is the term of the creative act and, being simple and immaterial, is necessarily incorruptible, i.e., immortal.

Scholastic epistemology is based on the principle that knowledge, sensuous and intellective, consists in the assimilation of object to subject, an assimilation engendered by the coöperation of the two. The stimulation of the psychic cognitive power by the object was called the *species impressa*, the reaction of the faculty the *species expressa*. In intellective cognition the object is presented through the phantasm from which the active intellect abstracts the intelligible species. In the wake of cognition follows appetition, sensitive or intellective. The latter—the will—is like every other power necessitated as to its general object, the good as such; though in respect to this or that good it is undetermined and intrinsically free.

Ethics was dominated by the concept of finality immanent in man as it is in the universe. Man's objective end is the vision of the infinite truth and the enjoyment of the infinite good, i.e., God. He is physically free, however, to place his end in the finite. If he do he will fail of his ultimate perfection and incur unending loss. The natural law of conduct is the reflection of the eternal law in consciousness. Acts are good or bad according as they are in accord or discord with human nature in its concrete existence. Special ethics and politics unfold and apply the natural law to the special individual relations of man.

There are obvious objections to the scholastic synthesis. It is accused of being one-sided, of neglecting the historic and inductive method, of being unprogressive, of merely unfolding what was already contained in received data, of bringing no new facts to light, but simply analyzing the facts at hand which it took for granted. All these and other such charges may with some obvious restrictions be admitted. Nevertheless, scholasticism centred the human mind on certain fundamental truths essential to the complete spiritual development of the race.

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la philosophie médiévale, précédée d'un aperçu sur la philosophie ancienne (Paris, 1900); John Rickaby, *First Principles of Knowledge* (4th ed., New York, 1901); William Turner, *History of Philosophy* (Boston, 1903); Albert Stöckl, *Handbook of the History of Philosophy* (Eng. trans. by T. A. Finlay, New York, 1903); Martin Grabman, *Grundriss der Philosophie* (Berlin, 1905); W. J. Townsend, *Great Schoolmen of the Middle Ages* (New York, 1905); M. M. C. J. de Wulfe, *Scholasticism Old and New* (Eng. trans. by Peter Coffey, ib., 1907); Joseph Rickaby, *History of Medieval Philosophy* (Eng. trans. by Peter Coffey, 3d ed., London, 1909); id., *Scholasticism* (ib., 1909); Martin Grabman, *Die Geschichte der scholastische Methode* (2 vols., Berlin, 1909–11); Michael Maher, *Psychology* (7th ed., New York, 1911); H. O. Taylor, *The Medieval Mind* (2 vols., ib., 1911); also general histories of philosophy and of the Middle Ages, and the lives of the schoolmen mentioned in this article.

SCHOLIASTS, skō'lī-āsts (MGk. σχολιαστής, *scholiastēs*, commentator, from σχολιαζειν, *scholiazein*, to write commentaries, from σχόλιον, *scholion*, commentary, from σχολή, *scholē*, leisure devoted to learning, learning, school). A name applied to annotators of classical works, especially Greek. These commentaries, *scholia*, were written on the margins or between the lines of the manuscripts and included explanations and interpretation of every kind. The earliest comments were merely glosses on difficult or unusual words, but with the Alexandrians learned comment in the larger sense began and continued through the Byzantine age. In Latin we have important scholia to Terence, Vergil, Horace, Statius, and others. Consult: Wilamowitz-Moellendorf, *Herakles*, introduction to vol. i (Berlin, 1889); W. G. Rutherford, *A Chapter in the History of Annotation* (vol. iii of his *Aristophanes*, London, 1905); J. E. Sandys, *A History of Classical Scholarship*, vol. i (2d ed., Cambridge, 1906).

SCHÖLL, shēl, Adolf (1805–82). A German archæologist and critic, born at Brünn, Austria, and educated at Tübingen, Göttingen, and Berlin. In 1843 he was appointed director of the Art Institute in Weimar, where he was made librarian in chief in 1861. He wrote *Die Tetralogien der attischen Tragiker* (1839), *Sophokles* (1842), *Weimars Merkwürdigkeiten* (1847), and many contributions to the criticism of Goethe. Consult the biography by his son Friedrich (Berlin, 1883).—His son Rudolf (1844–93) was born in Weimar and after studying at Göttingen and Bonn traveled in Italy with Theodor Mommsen. He was successively professor at Greifswald, Jena, Strassburg, and Munich. He wrote *Legis Duodecim Tabularum Reliquiæ* (1866) and *De Synegoris Atticis* (1875).—Rudolf's brother Friedrich (1850–), born at Weimar, studied at Göttingen and Leipzig and in 1877 became professor at Heidelberg. Best known as a pupil of Ritschl, Schöll was one of the coeditors of the Teubner text of Plautus (1892–95; revised, in part, 1904–06) and of certain plays in the great Triumvirate edition of Plautus, begun by Ritschl (q.v.), in 1881–94. With G. Götz he edited the text of Varro, *De Linguæ Latina* (Leipzig, 1910). He published also *Briefwechsel mit Fr. Nietzsche*, vols. i, ii (1900–02).

SCHOLL, shōl, Aurélien (1833–1902). A French journalist, dramatist, and miscellaneous writer, born at Bordeaux. Having studied at the Collège de Bordeaux he went to Paris in 1850. He founded successively *Le Nain Jaune*, *Le Club*, *Le Jockey*, *Le Lorgnon* (1869). After the Franco-German War he was on the staff of *L'Événement* (1872–82), then editor in chief of *Le Voltaire* (1882–83), and an editor of *L'Echo de Paris* (1883–85). Scholl published in 1851 a volume of verses, *Denise*. He collaborated in many dramas and showed his clever and piquant wit at its best in *L'Esprit du boulevard* (1883) and *L'Amour appris sans maître* (1891).

SCHÖLL, shēl, Maximilian Samson Friedrich (1766–1833). A German historian and diplomat, born at Harskirchen in Nassau-Saarbrücken. Having embraced the principles of the French Revolution he for a time held office in Strassburg, but was compelled to flee to Germany. Subsequently he held various diplomatic positions in the Prussian service, and he accompanied Hardenberg to the congresses of Vienna, Aix-la-Chapelle, Teplitz, Troppau, Laibach, and Verona. His many published works include: *Recueil de pièces officielles destinées à détromper les français sur les événements qui se sont passés depuis quelques années* (1814–16); *Histoire de la littérature romaine* (1815); *Recueil des pièces relatives au congrès de Vienne* (1816–18); a continuation of Koch's *Histoire abrégée des traités de paix*, etc. (1817–18); *Archives historiques et politiques* (1818–19); *Tableau des révolutions de l'Europe* (1823); *Cours d'histoire des états européens depuis le bouleversement de l'empire romain jusqu'en 1789* (1830–33), his most elaborate work.

SCHOLTEN, skōl'ten, Jan Hendrik (1811–85). A Dutch theologian. He was born at Vleuter, near Utrecht, studied at Utrecht, and was minister at Meerkerk (1838–40). He was professor of theology at the Athenæum of Franeker (1840–43) and in the University of Leyden (1843–81). Scholten was the head of the critical school of theology in Holland and in some of his views approached the position of the Tübingen school of Germany. He published many works, the greater number dealing with questions of New Testament criticism or theology. Most of them are accessible in French or German translations. He summed up his teaching in his farewell address, *Afscheidsrede* (1881). Consult A. Kuenen, *Levensbericht van I. Henricus Scholten* (Amsterdam, 1875).

SCHOLZ, shōlts, Bernhard (1835–). A German composer, born at Mainz. He studied the piano with Ernst Pauer and theory with S. W. Dehn. In 1856 he was appointed teacher of theory at the Royal School of Music in Munich and from 1859 to 1865 was kapellmeister at the Court Theatre in Hanover. In 1883 he succeeded Raff as director of the Hoch Conservatory at Frankfort. In 1908 he retired from all active work. Besides the operas *Carlo Rosa* (1858), *Morgiane* (1870), *Der Trompeter von Säckingen* (1877), *Ingo* (1898), and *Mirandolina* (1907), he composed a requiem, cantatas, a symphony, a string quintet, and other chamber music, choral works, and songs. His best-known work is his setting of Schiller's *Lied von der Glocke*, for solo, chorus, and orchestra.

SCHÖMANN, shē'mân, Georg Friedrich (1793–1879). A German classical scholar. He was born at Stralsund and after studying at Greifswald and Jena was professor of classical literature at the former university from about 1826 till his death. His works, which refer

chiefly to Greek law and literature, are distinguished by their profundity and clearness. Among the most important are: *Der attische Prozess* (1824; reëdited by Lipsius, 1883–87), with Meier; several grammatical works and critical editions of Isæus (with translation, 1831); Plutarch's *Agis et Cleomenes* (1839); Æschylus' *Prometheus* (1844); Cicero's *De Natura Deorum* (1850); *Griechische Altertümer* (1850–59; Eng. trans. by Hardy and Mann, 1880); Hesiod's *Theogony* (1868). Selections from his minor works on Greek history, mythology, and archæology were published in his *Opuscula Academica* (1856–57). Consult J. E. Sandys, *A History of Classical Scholarship*, vol. iii (Cambridge, 1908).

SCHOMBERG, shŏm'bĕrk, Frederick Hermann, Duke of (1615–90). A German soldier of fortune, born at Heidelberg. He served in the army of the United Provinces and in the French army. During the War of Liberation in Portugal he held important commands and finally succeeded in compelling Spain to recognize the independence of that country (1668). In 1675, again serving with the French army in Catalonia, he won the grade of marshal. He left France in 1685 and, after serving a short time with the Elector of Brandenburg, was appointed by the Prince of Orange his second in command in the English expedition of 1688. Afterward (1689) he received the title of Duke of Schomberg in the English peerage, was made a Knight of the Garter and also master of the ordnance, besides receiving a grant of £100,000 from Parliament. In the expedition against Ireland he took a prominent part, but was killed at the battle of the Boyne.

SCHOMBURGK, shŏm'bŭrk, Sir Robert Hermann (1804–65). A traveler and explorer, born at Freiberg in Prussian Saxony. He became a merchant and emigrated to the United States in 1829 and the next year removed to Anegada, one of the British West India islands, which he thoroughly explored. In 1835 the Royal Geographical Society sent him on a scientific expedition to British Guiana, where he explored a vast tract of territory previously almost unknown. In 1840 he was sent to Guiana, where he spent another four years exploring the Hinterland and surveying the boundaries of the colony. The so-called Schomburgk line played an important part in the controversy between Great Britain and Venezuela. (See Venezuela.) In 1844 he was knighted. Four years later he was appointed British Consul at Santo Domingo, and in 1857 he was promoted to be Consul General at Bangkok. His published works include: *Description of British Guiana, Geographical and Statistical* (1840); *Twelve Views in the Interior of Guiana* (1841); *History of Barbadoes* (1847). His most famous botanical discovery was that of the *Victoria* (q.v.) *regia*.

SCHÖN, shĕn, Heinrich Theodor von (1773–1856). A Prussian statesman, born in Schreitlauken, Prussian Lithuania. He studied law and political science at Königsberg, and in 1793 he entered the government service and was rapidly promoted. After the Peace of Tilsit he rendered great assistance in carrying out the reforms of Stein and Hardenberg, and to him is attributed the authorship of the *Politisches Testament*, which Stein issued upon his retirement from office. In 1816 Schön was appointed Governor of West Prussia and eight years afterward of the whole Province of Prussia. Under his administration many reforms were made. He was an ardent Liberal, and it was partly through his efforts that upon the accession of King Frederick William IV in 1840 a demand was made for a constitution. Schön was made a minister without portfolio, but his ideas were too advanced for the King, and he found it expedient in 1842 to retire from political life. Afterward, as burgrave of Marienburg, he was instrumental in the restoration of the old castle of the Teutonic Knights. His memoirs and correspondence were published by his son under the title of *Aus den Papieren des Ministers und Burggrafen von Marienburg Theodor von Schön* (1875–83). Consult Seeley, *Life and Times of Stein* (Cambridge, 1878).

SCHÖNBACH, shĕn'bäg, Anton (1848–1911). An Austrian Germanic philologist, born at Rumburg, Bohemia. After studying in Vienna and under Scherer and Müllenhoff in Berlin he began to lecture at Vienna in 1872 and was appointed professor at the University of Graz in 1873. Besides valuable editions of Old-German sacred poetry and prose, such as *Ueber die Marienklagen* (1874), *Altdeutsche Predigten* (1886–91), *Auslese altdeutscher Segensformeln* (1893), he published: *Beiträge zur Charakteristik Hawthornes* (1884); *Ueber Hartmann von Aue* (1894); *Walther von der Vogelweide* (2d ed., 1895); *Das Christentum in der altdeutschen Heldendichtung* (1897); *Die Anfänge des deutschen Minnesangs* (1898); *Studien zur Erzählungs-litteratur des Mittelalters* (8 vols., 1898–1909); *Gesammelte Aufsätze zur neueren Litteratur in Deutschland, Oesterreich, Amerika* (1900); *Ueber einige Evangelienkammentare des Mittelalters* (1903); *Ueber Gutolf von Neiligenkreuz* (1904); *Ueber Hermann von Reun* (1905); *Ueber Lesen und Bildung* (7th ed., 1905), very popular. Conjointly with Bernhard Seuffert he edited the *Grazer Studien zur deutschen Philologie* (6 parts, 1895–1900).

SCHÖNBEIN, shĕn'bīn, Christian Friedrich (1799–1868). A German chemist, born at Metzingen, Swabia. He studied natural science at Tübingen and Erlangen and became lecturer at Basel in 1828 and professor in 1835. In 1839 he discovered ozone and in 1845 invented guncotton, from which, by dissolution in a mixture of alcohol and ether, he obtained the material called collodion, which soon found application in surgery. His works include: *Das Verhalten des Eisens zum Sauerstoff* (1837); *Beiträge zur physikalischen Chemie* (1844); *Ueber die Erzeugung des Ozons* (1844); *Ueber die langsame und rasche Verbrennung der Körper in atmosphärischer Luft* (1845). For his biography, consult Hagenbach (Basel, 1868) and Kahlbaum and Schaer (Leipzig, 1901).

SCHÖNBERG, shĕn'bĕrk, or Mährisch-Schönberg. A town of the Province of Moravia, Austria, on the river Tess, 159 miles by rail east by south from Prague (Map: Austria, E 2). It lies in a charming valley, has a handsome church, and a weaving and agricultural school. It is an industrial centre, with large manufactures of textiles. Pop., 1910 (district), 80,384.

SCHÖNBERG, Arnold (1874–). An Austrian composer of extremist tendencies, born in Vienna. Up to his twentieth year he had studied entirely by himself and then went for a short time to Zemlinsky. In his first works

he went beyond the most advanced of the moderns, and in his *Gurre Lieder*, scored for 5 solo voices, a double chorus of 8 and 12 voices respectively, with an orchestra of 114 parts, he lands in absolute chaos. His works include 3 string quartets; a string sextet, *Verklärte Nacht;* a chamber symphony for 15 instruments; a symphonic poem, *Pelleas und Melisande*. Consult J. G. Huneker, *Ivory, Apes, and Peacocks* (New York, 1915).

SCHÖNBRUNN, shēn-brụn′. A famous palace in the outskirts of Vienna, the summer residence of the Imperial family (Map: Austria, B 5). Here the Treaty of Schönbrunn between Austria and France, following the victory of Napoleon at Wagram, was signed on Oct. 14, 1809. Austria surrendered Salzburg, part of Upper Austria, and Carinthia, Carniola, most of Croatia, the Adriatic coast land, and the territory which she had taken in the third partition of Poland (1795).

SCHÖNEBECK, shē′ne-bĕk. A town in the Province of Saxony, Prussia, on the Elbe, 8 miles south-southeast of Magdeburg (Map: Germany, D 3). It has important chemical works and salt refineries. It also manufactures matches, colors, buttons, machinery, artificial guano, etc. There is a trade in grain, timber, and coal. Pop., 1900, 16,257; 1910, 18,308.

SCHÖNEBERG, shē′ne-bĕrk. A residential suburb of Berlin (q.v.). It is the seat of an aërial navigation bureau of the German army and has an observatory and a large private insane asylum. The manufactures include sulphite cellulose, photographic apparatus, paper, lightning rods, and military supplies. There is also a large railway repair and construction shop. Pop., 1900, 96,059; 1910, 172,823.

SCHÖNEFELD, shē′ne-fĕlt, Henry (1856–). An American composer and pianist, born in Milwaukee, Wis. In 1874 he went to Leipzig for study. He returned to America in 1879 and settled in Chicago, where he conducted several musical societies and was on the faculty of the Hershey School of Music. He was one of the first American-born composers to use negro folk songs. He became a member of both the Chicago and the New York Manuscript Society. His compositions include *Gypsy Melodies, Liberty, In the Sunny South, Rural Symphony, Reverie, Serenade, Valse Brilliante, Kleine Tanz Suite,* and two concertos.

SCHÖNEMANN, shē′ne-mân, Anna Elisabeth (1758–1817). A friend of Goethe, the daughter of a wealthy Frankfort merchant. When she was only 16, Goethe, then 25 years old, fell deeply in love with her; but, if an engagement took place at all, it was soon broken, and she married Baron von Türckheim. She was the Lili of Goethe's lyrics of that period. Consult Von Dürckheim, *Lillis Bild* (2d ed., Munich, 1894), and Bielchowsky, *Friederike und Lili* (ib., 1905).

SCHÖNFELD, shēn′fĕlt, Eduard (1828–91). A German astronomer. He was born at Hildburghausen, Meiningen, and in 1853 became an assistant to Argelander at the Bonn Observatory, where he aided in the preparation of the *Durchmusterung* of the northern heavens. From 1859 to 1875 he was director of the Mannheim Observatory and there published his extensive observations of nebulæ and of variable stars. In 1875 he returned to Bonn as professor of astronomy and director of the observatory. He extended Argelander's survey of the heavens down to 23° south declination and published the results in a catalogue of 133,659 stars in the *Bonner Sternverzeichnis,* sect. iv (1889).

SCHONGAUER, shōn′gou-ēr, Martin (c.1445–91). A painter and engraver of the early Suabian school, the greatest German artist of the fifteenth century. He was commonly called Martin Schön or Hübsch Martin, by reason of his beautiful art. He was born at Kolmar, Alsace, the son of Kaspar Schongauer, a goldsmith of Augsburg. Martin probably practiced at first his father's craft and, turning to painting early, was presumably instructed by Kaspar Isenmann, then the most prominent painter of Kolmar, whose influence is traceable in Schongauer's work. Whether he afterward studied under Rogier van der Weyden is open to doubt, but he surely passed an apprenticeship in the Netherlands and was deeply impressed by the works of Rogier, emancipating himself only gradually from their influence. After his return he established at Kolmar a studio for painting and engraving, frequented by numerous disciples and assistants. While engaged upon a commission at Breisach, he died on Feb. 2, 1491.

The number of Schongauer's authenticated paintings is very limited, and his artistic development can therefore be more easily estimated from his engravings. His early period is best represented by the "Madonna in an Arbor of Roses" (1473), now in the Schongauer Museum at Kolmar, a highly finished work, in which the Flemish type is unmistakable. A smaller version of the same subject is in the Gardner collection, Boston. Of later date is, in the same museum, the series of 16 panels depicting the "Passion of Christ," in which native German influences preponderate. Most of these were executed by pupils after his designs, but two, "The Triumphal Entry" and "Christ in Gethsemane," are worthy of the master himself. A similar progress may be observed in the two altar wings with the "Annunciation" and the "Child Adored by the Virgin and St. Anthony." His latest stage is well exemplified by two exquisite small pictures of the "Holy Family," in the Pinakothek at Munich and the Vienna Museum. The Berlin Museum possesses a valuable triptych, with a central panel of "The Birth of Christ."

As an engraver Schongauer ranks as the foremost artist of his day. His modeling and shading are firm and delicate, the compositions highly picturesque, and the landscape backgrounds exceed anything previously achieved in German art. Among his 117 plates some of the most remarkable are the "Bearing of the Cross," "The Annunciation," "Christ on the Cross," "The Wise and Foolish Virgins," "The Temptation of St. Anthony," "Christ Enthroned," and the ideal figure of "St. Agnes." The most comprehensive reproduction of his engravings is Amand-Durand, *Œuvre de Martin Schongauer,* with text by Duplessis (Paris, 1881). Consult Daniel Burckhardt, *Die Schule Martin Schongauers am Oberrhein* (Basel, 1888); Bach, "Neues über Martin Schongauer," in *Repertorium für Kunstwissenschaft,* vol. xxii (Berlin, 1899); Hans Wendland, *Martin Schongauer als Kupferstecher* (ib., 1906).

SCHÖNING, shē′nĭng, Gerhard (1722–80). A Norwegian historian and archivist, born at Skotnes, Lofoten. Educated at Trondhjem and

at Copenhagen University, he became rector in Trondhjem, where he founded, with Gunnerus and Suhm, the Trondhjem Learned Society (1760). In 1765 he was appointed professor of history and elocution at Sorö Academy and in 1775 state archivist. He published many works, especially on the early history of Norway, including: *Norges Riges Historie* (till 995, 3 vols., 1771–81); *Reise gjennem Norge* (1772–75; published 1910); a translation of *Heimskringla* (2 vols., 1777–78; completed in 6 vols., 1826). His library (11,000 volumes) he willed to the Learned Society in Trondhjem.

SCHÖNLEBER, shēn'lā-bĕr, GUSTAV (1851–). A German landscape painter. He was born in Bietigheim, Württemberg, and studied in Stuttgart and then in Munich under Lier. After traveling extensively in Italy and Holland he was in 1880 called to the Academy of Karlsruhe, of which institution he afterward became director. Among his principal paintings may be mentioned: "Castello di Paraggi" (1893); "Venice" (Hamburg Kunsthalle); "Madonetta" (Munich Pinakothek); "Autumn in Rapallo" (Berlin Gallery); "Rothenburg-on-the-Taube" (mural painting in the Reichstag, Berlin); and numerous scenes in Italy, Holland, and England, besides village views in Germany, all of which he interprets with genuine poetic feeling. As a colorist Schönleber is harmonious and delicate, with a fine understanding for the effects of light on water. In drawing he has the precision of the Renaissance allied to the most modern composition. He became known also as an etcher and illustrator and received gold medals at Munich, Berlin, and Vienna.

SCHÖNLEIN, shēn'līn, JOHANN LUKAS (1793–1864). A German professor of medicine, born in Bamberg. He studied medicine at Landshut, Jena, Göttingen, and Würzburg (M.D., 1816). After teaching at Würzburg and Zurich he was called to Berlin in 1839. There he taught therapeutics and pathology and directed the clinical department in the university. He was also appointed physician to Frederick William IV. After his retirement in 1859 he lived in Bamberg. He was one of the first German medical professors to lecture in the native tongue instead of in Latin. He also introduced clinical lectures, demonstrating the disease he spoke of by the patient and using all modern examinations, such as uranalysis, auscultation, percussion, and the microscope. Schönlein described purpura rheumatica (Schönlein's disease) and discovered the parasitic cause of ringworm (*Achorion Schönleinii*). Consult Virchow, *Gedächtnisrede auf Schönlein* (Berlin, 1865).

SCHÖNTHAN, shēn'tän, FRANZ VON (1849–1913). An Austrian dramatist, born in Vienna. After serving four years in the navy he went on the stage and also began to write for periodicals. His first successful dramatic effort was *Das Mädchen aus der Fremde* (1879), upon which followed the farce *Sodom and Gomorrha* (1880) and, in collaboration with Moser, *Der Zugvogel* and *Krieg und Frieden*, played on all the stages of Germany. Stage manager of the Stadtheater in Vienna in 1883–84, he lived afterward alternately in Berlin and on his estate at Brunn, near Vienna, then for some years at Dresden, but finally settled at Vienna. Of his numerous comedies, often partaking of a farcical character, may be mentioned: *Unsre Frauen* (1881, with Moser); *Der Schwabenstreich* (1882); with his brother Paul: *Der Raub der Sabinerinnen, Frau Direktor Striese* (1885), *Das gelobte Land* (1892); with Kadelburg: *Goldfische* (1886), *Die berühmte Frau* (1887), *Der Herr Senator* (1894); with Kopell-Ellfeld: *Komtesse Guckerl* (1895), *Renaissance, Die Goldene Eva* (1896), *Florio und Flavio* (1901); and *Maria Theresia* (1903), *Klein Dorrit* (1905), and *Sherlock Holmes* (1905).

His brother PAUL (1853–1905), after serving in the army, became a journalist in Vienna and published numerous tales and novels, notably: *Welt- und Kleinstadtgeschichten* (1889); *Ringstrassenzauber* (1894); *Schlechte Rasse* (1894); *Geberden der Liebe* (1895); *Wiener Luft* (1897); *Enfant terrible* (1897); *Brave und schlimme Frauen* (1901); *Pariser Modell* (1902); also *Die elegante Welt: Handbuch der vornehmen Lebensart* (6th ed., 1895).

SCHOODIC RIVER. See SAINT CROIX RIVER.

SCHOOL BUILDINGS. The architecture of school buildings has in recent years taken on great importance, and well-defined types have been developed in Europe and America for each kind of school—graded and high schools, manual-training and normal schools, boarding schools for boys and girls, in city and country. The United States, which long lagged behind France and Germany in the architecture of its school buildings, now stands at least abreast, if not indeed in advance, of them. Certain fundamental problems are common to all types; such are the lighting and ventilation of classrooms, the space to be allowed per desk, the height of stories, the proper designing of stairs and corridors, the provision, design, and equipment of toilet rooms, cloakrooms, etc., and the provision for special functions, such as gymnasium, laboratories, drawing-rooms, assembly halls, playrooms, and the like. Open-air study places, roof gardens, playgrounds, workshops, etc., are other problems of increasing importance; so also the question of grouped *versus* consolidated buildings, the number of stories permissible in crowded cities, and others of like nature. Many of these problems are still under discussion, for which the reader is referred to such books as J. A. Moore, *The School House: Its Heating and Ventilation* (Boston, 1905); Felix Clay, *Modern School Buildings* (London, 1906); Ernst Vetterlein, *Die Baukunst des Schulhauses* (2 vols., Leipzig, 1909); "Modern School Houses," in the *American Architect* (New York, 1910); W. T. Mills, *American School Building Standards* (Columbus, Ohio, 1915).

SCHOOLCRAFT, HENRY ROWE (1793–1864). An American ethnologist. He was born in Watervliet (now Guilderland), N. Y. He studied mineralogy and chemistry for a year in Union College and in 1817 began the publication of a work on *Vitreology*. In 1817–18 he made a tour of the West, especially through southern Missouri and Arkansas, to study mineralogy and geology. The result was a volume entitled *A View of the Lead Mines of Missouri*. In the following year he received an appointment from the government to explore the upper Mississippi and the copper regions of Lake Superior. In 1822 he was made agent for the tribes about Lake Superior and thenceforth turned his attention to history and ethnology. In 1831 he was one of the principal founders of the Algic Society in Detroit, devoted to the antiquities and ethnology of the American aborigines. In 1836 he was instrumental in settling land dis-

putes with the Chippewas, and by the treaties then effected the United States became possessed of vast territory, worth many millions of dollars. It was while he was engaged as Superintendent of Indian Affairs in this Northern Department that he published his *Algic Researches* (1839). From this period Schoolcraft gave his attention to literary pursuits. His chief contribution to the history of Indian affairs was his six quarto volumes entitled *Historical and Statistical Information Respecting the History, Condition, and Prospects of the Indian Tribes of the United States* (1851–57). The work is partly from his pen and partly a collection of essays of greater or less value by others. Among his other publications the most important are: *Onéota; or the Red Race of America* (1844); *Notes on the Iroquois* (1846); *Personal Memoirs of a Residence of Thirty Years with the Indian Tribes on the American Frontiers* (1863).

SCHOOL DISEASES. See Hygiene; Schools, Medical Inspection of.

SCHOOL FOR COOKS AND BAKERS. See Mounted Service School.

SCHOOL FOR SCANDAL, The. A very popular comedy by Richard Brinsley Sheridan, produced in 1777. Much of the action centres in the devotees of scandal who meet at Lady Sneerwell's house to destroy reputations.

SCHOOLMASTER. A term sometimes applied in the United States and England to persons engaged in carrying on elementary and secondary instruction. In the great public schools of England from the beginning schoolmasters have been chosen usually with considerable care. Most of the charters of the great public schools provided for the election of head masters from among the Masters of Art of either Oxford or Cambridge University. With the establishment of training colleges for teachers, and the assumption of the responsibility of supervision of education in the latter half of the nineteenth century by the English government, educational matters took a turn for the better, and the condition of the schoolmaster has since rapidly improved.

In the United States the same marked development in the status of the schoolmaster may be noticed. In Colonial times there were no trained teachers. Whoever chose to set himself up as schoolmaster was allowed to do so without regard to his previous training or attainments. There was no inducement for able young men to enter the teaching profession. Salaries were low, and the status of a schoolmaster was correspondingly insignificant, and only with the educational awakening of the Horace Mann period begins the rise of teaching as a profession. At common law the authority of the schoolmaster was that of one *in loco parentis*, and where unmodified by statute this rule still persists. See Teachers' Pensions; Teachers' Salaries.

SCHOOLMASTER, The. A work on education by Roger Ascham (1570), which gives his methods of learning Latin and of training children.

SCHOOLMEN. See Scholasticism.

SCHOOL OF ANATOMY. A celebrated painting by Rembrandt in the museum at The Hague, representing Dr. Tulp of Amsterdam demonstrating over a cadaver. See Rembrandt.

SCHOOL OF ATHENS. See Raphael.

SCHOOL OF BAKERS AND COOKS. See Mounted Service School.

SCHOOL OF EQUITATION. See Mounted Service School.

SCHOOL OF FARRIERS AND HORSESHOERS. See Mounted Service School.

SCHOOL OF FIRE FOR FIELD ARTILLERY. A service school for officers of the field artillery of the United States army established at Fort Sill, Oklahoma, in 1911. At this post an extensive garrison of field-artillery batteries is maintained, so far as conditions of the service permit, and a regular course of instruction which lasts three months is maintained for captains and lieutenants. There is also instruction for field officers lasting one month, and a special course for artillery officers of the organized militia. See Military Education; Mounted Service School.

SCHOOL OF MUSKETRY. A service school of the United States army, established in 1913, at Fort Sill, Oklahoma, for the purpose of giving instruction in small-arms firing. The general plan was to establish a school where systematic and methodical rifle practice could be carried on by officers and men of the United States army and the ballistics of small arms studied under practical conditions. In the summer of 1913 such work was in progress with officers and men from both the regular army and the militia in attendance, but disturbed conditions on the Mexican border and elsewhere for several years afterward acted against the establishment and maintenance of regular courses of instruction.

SCHOOLS (AS. *scōlu*, from Lat. *scola, schola*, learned discussion, lecture, school, from Gk. *σχολή, scholē*, learning, leisure, school). Places where instruction is given.

The elementary instruction of the Hindu Brahman is given either out of doors or in some rude building. Instruction is to a large extent oral. The Brahman repeats certain passages which the pupils are expected to learn to repeat. Writing is first practiced in sand. The more advanced grades of Hindu instruction involve extensive reading. In China each pupil provides his writing table and chair, his books and writing materials. The school hours are from sunrise till 5 P.M., with an intermission of an hour from 10 A.M. to 11 A.M. The children learn to pronounce the characters in their books by imitating their teacher. Reading matter is committed to memory by repeating it aloud. As the written language differs from the spoken one, these exercises are like learning to pronounce and read the characters of a foreign tongue without understanding their significance. Later on exercises in translation and composition appear. Among the Hebrews the Law was expounded by teachers in the porches of the temple. The synagogues were used for a similar purpose, and in them children were instructed during the week. The amount of instruction grew until, from being merely an oral teaching of the Law, it involved letters and arithmetic. Elementary schools became common after the Christian era, and in 64 A.D. they were made obligatory by the high priest Joshua ben Gamala. The Spartan education was chiefly physical, consisting of athletic exercises and dancing, frequently accompanied by chanting. It was conducted in the open air under the guidance of officers. Each youth was also under the special charge of an adult, whose office was to inspire him to exert his best powers. At Athens the schools were probably all conducted as private ventures. Some were situated

in the open air or in the porticoes of temples. There were two classes of schools for boys. One, the musical or literary school, was taught by a grammatist. Instruction in the nonliterary phases of music was often given by a citharist. The other school, the palæstra or gymnastic school for boys, which may have been public, was under the pædotribe. In the literary school the curriculum included reading, writing, arithmetic, and in some cases drawing and geography. The poets, especially Homer, were for the most part the authors read. Arithmetic was very simple, being that necessary for ordinary business. The abacus was used. In writing, younger pupils employed the wax tablet and the stylus; older ones, pen and ink, with papyrus. Maps are known to have been in use. Older students attended a gymnasium, where the instruction was more of a professional character. Younger boys were accompanied to school by a pedagogue (παιδαγωγός), to whom was intrusted the general oversight of the conduct and welfare of his charge. The pedagogue of that day was usually a slave. The hours of daylight were all consumed at school.

At Rome primary instruction was given in the ludus. Reading and writing were here taught, and sometimes arithmetic. Frequently, however, a special teacher of arithmetic was employed. Pebbles (calculi) were used in figuring, and the stylus and wax tablet in writing. The books were rolls of manuscript carried in wooden boxes. The schools were conducted as private ventures and were sometimes held in the open air. Usually, however, they were in mean and sparsely furnished apartments. The children sat on the floor. The work was largely that of committing to memory, and discipline was severe, flogging being a common resort. The pedagogue existed as in Greece. At about 12 years of age the boy passed into a secondary school, that of the grammaticus. Here he was taught grammar, Greek, and a little geography and geometry. The quarters were usually somewhat better than those of the ludus. Children sat on benches, while the master occupied a raised seat or cathedra. In later times some of these schoolrooms were adorned with works of art. The elementary teacher among both Romans and Greeks was held in low esteem, if not in positive contempt.

During the Middle Ages, as the Church conceived education to be its function, wherever an association of the clergy existed some instruction was commonly expected to be carried on. Secondary instruction comprised the trivium (q.v.), and the quadrivium (q.v.) constituted the higher education. The schoolrooms, methods, and discipline were in harmony with the ascetic spirit of the time. Shortly after the beginning of the "trivial" studies, boys not destined for the Church were usually withdrawn from the school. More advanced novices were set to teach lower classes. A considerable number of the pupils in the schools were charitably cared for, and in many institutions no great pains were taken with their instruction, except to render them effective in performing the Church services. In general, however, instruction was free. The guild schools, taught ordinarily by the chaplain of the guild, gave a little instruction in Latin, such as would be required in business, where accounts and correspondence were to a considerable extent in that language. More stress was laid in these schools on arithmetic, and in Germany one guild, the Rechenmeister, developed this subject extensively.

The appearance of printed books gave a powerful impetus to learning, and the Renaissance introduced new motives into higher education. Power to appreciate the beauty of literature and skill in literary composition, such as poetry and letter writing, became objects of desire on the part of the aristocratic classes in society. A class of lay teachers sprang into existence to satisfy the demand. Private schools became a source of considerable income and social prestige to their masters, and tutorial education assumed unprecedented importance. A variety of methods and subjects were introduced or proposed for enlivening the school atmosphere. History became a prominent subject, and great stress was laid on the classics as literature. Declamation, the acting of plays, poetic composition, etc., appear everywhere as school exercises. Study of the vernacular is gradually introduced, and later a mastery of French becomes indispensable for the diplomat and practically so for the cultivated man. The educational critics and reformers of the period and the sixteenth and seventeenth centuries urge the need of making the school more interesting by mitigating the severity of the discipline, especially as regarded corporal punishment, by increasing the attractiveness of the schoolrooms, by introducing gymnastic exercises, study of the world of nature at first hand, and illustrated textbooks. Rabelais, Montaigne, Comenius (q.v.), and Locke represent the advanced thought of the time. A prevalent custom among the upper classes was to send youths on the "grand tour" accompanied by a tutor. Even before the Renaissance the custom of wandering from one educational centre to another existed. The development of universities increased the practice of traveling. Frequently students without means begged their way.

In the seventeenth and eighteenth centuries there flourished in Germany the Ritterakademien, or academies for nobles. They were usually situated in the capital city of a principality, and the students participated in the social life of the court. Stress was laid on the study of French, and drawing and fencing masters were employed. In England and France similar "courtly academies" were developed to give a training for practical life that the classical schools failed to impart. An interest in athletics also began to manifest itself at this time in the English public schools.

The Renaissance, by expanding enormously the trivium or secondary-school curriculum, led to elaborate systems of grading of students. The Brethren of the Christian Schools, an order founded by La Salle in 1683, employed for the first time in elementary instruction the system of grading, and instruction was given to classes instead of individuals. Before the eighteenth century manual training had appeared in the schools. The institutions founded by Francke at Halle included burgher schools and a Paedagogium, in both of which students were trained in the manual arts. These schools also offer examples of the study of natural science by laboratory methods.

The complex and rapid development of modern schools is best studied under the titles given at the end of this article.

Religious and Moral Education in Schools. The history of religious education has been bound up with that of the control of education by

priesthoods or churches. Inasmuch as the civic virtues of the people are cultivated and sanctioned by religious observances and beliefs, religious education has been of the greatest importance in developing cohesive and powerful nationalities. This is especially true while the religion remains a purely national one. With the appearance of cosmopolitan religions like Christianity and Mohammedanism, the value of religious education for the cultivation of a specifically national spirit became less. In Europe church and state drifted apart, and the former, as dealing with man's spiritual interests, assumed control of education. The Reformation, by introducing nationalism again into matters of religion, led to the active assumption by Protestant rulers of authority over education as one of the phases of religious responsibility. In the struggles that followed, religious education was felt to be a means, not merely of furthering man's eternal and spiritual welfare, but also of strengthening the state. The multiplication of sects, however, leading often to a separation of church from state, has tended to drive from the state schools sectarian religious instruction, and to exclude or minimize ecclesiastical control or inspection. The Catholics maintain schools of all grades in the United States, England, and the Catholic nations of Europe. (See PAROCHIAL SCHOOLS.) In France up to the time of the enforcement of the Associations Law a considerable part of both elementary and secondary education was carried on by different Catholic orders. In these schools religious instruction constituted an important part of the curricula. See FRANCE, *Education*.

Three classes of conditions in respect to religious instruction prevail in state schools. 1. The ordinary instruction of the day includes denominational religion and morals. In Prussia it may be either Catholic or Protestant, according to the prevailing religion of the locality. In England in the voluntary schools it has been either Episcopalian or Dissenting, according to the auspices under which the school is run. The children need not attend these exercises if their parents object. The Act of 1906 proposed, however, to destroy denominational control and to put all publicly supported schools under undenominational boards. At the same time one and one-half hours each week might be set aside for denominational teaching, provided four-fifths of the people in the locality so desired. 2. Undenominational religious instruction is given in regular school hours. It includes usually Bible study, ordinary Christian ethics, and sometimes the simplest notions of faith. Such instruction appears in English graded schools and to some exent in American schools, where, however, it is usually limited to Bible reading. In New England Bible reading and prayer are a common part of the programme of school work. In Massachusetts this is required, but children may withdraw if the parents so desire. 3. The schools offer no religious instruction. This condition is illustrated in most of the schools of the United States where sectarian instruction is forbidden in many of the States, a provision held by the Supreme Court of Wisconsin in 1890 to include the reading of the Bible. The state schools of France give no religious instruction, but morals constitute a regular part of the daily programme, and such instruction is much emphasized by the school authorities. The French school programme contains a great deal of instruction of an ethical and religious but nondenominational character.

The disappearance of religious education from the national schools has created considerable antagonism to them on the part of religious interests. Such controversies have been bitter in England, France, Holland, and to some extent in the United States. Schools supported by denominations, notably the Roman Catholics, exist in great numbers in England and in the United States. In France they carried on about 40 per cent of the instruction until the recent legislation, requiring them to submit to state inspection and eventually determining on their suppression within 10 years, as dangerous to the Republic. The secularization of instruction has led to various attempts to develop religious and moral instruction apart from the school; e.g., by such agencies as Sunday Schools, Christian associations of all sorts, etc. In the United States the Sunday schools together with the parochial schools of the Catholic church reach about 40 per cent of the children of school age. The Young Men's Christian Association has a membership of over 300,000. Many are also advocating more instruction in morals and manners after the French plan, and the Legislature of Virginia passed in 1906 a law requiring such instruction in public schools. This movement is to some extent united with an advocacy of Bible study as part of the regular curriculum. At the same time strenuous efforts are being put forth to improve the quality of religious and moral instruction, whether within or without the school. The Religious Education Association organized in Chicago in February, 1903, has done much in that direction. Teachers College of Columbia University has been among others a pioneer in endeavoring to develop trained Sunday-school teachers.

The earlier Colonial schools of the United States were usually under sectarian control and gave much attention to religious instruction. After the Revolution the spirit of freedom in religious matters became dominant. The First Amendment to the Constitution declares that "Congress shall make no law respecting an establishment of religion or prohibiting the free exercise thereof." The States also have followed the spirit of this provision. The lack of specific religious instruction in the public schools has, however, been felt by many to be a serious defect. The Catholics, while agreeing and even insisting that the public school should be nonsectarian, have urged that their own parochial schools should be subsidized out of the public funds to which they have contributed. In New Mexico and Georgia they have succeeded in getting such appropriations. There has also been a general feeling that the knowledge of the Bible even as a work of literature is fast disappearing. The Sunday school, to which the churches have resorted for the religious instruction of the young, is felt to be inadequate and to fail in reaching a large portion of the population. In the United States one feature of the so-called Gary Plan (see below) that aroused most interest and discussion, favorable and otherwise, was the provision for optional religious instruction.

School of Varied Activities (THE GARY PLAN). In the field of administration and school organization interest, at the date of writing, centred in the school system of Gary, Ind. (q.v.), which had given rise to the terms Gary Plan, Gary System, or Wirt System (named after Wil-

liam A. Wirt, superintendent of the Gary schools). The very rapid growth of the city of Gary, the population of which was largely foreign-born, necessitated an educational scheme of the greatest flexibility. The opportunity for experiment was made the most of by Mr. Wirt. One great aim was to secure the maximum of efficiency with a minimum of expenditure. To this end there was developed what is known as the alternating plan of studies, under which the pupils give half a day to regular studies of the curriculum and half a day to special activities of various kinds. Upon this basis an eight-classroom building, when supplemented by a few special rooms and the playground, was made to accommodate 16 classes. Both the regular and the special studies were in charge of specialist teachers—an arrangement which, it was claimed by the superintendent, did away with the need of supervisors and gave the pupils the advantage of the departmental system and of flexibility. This feature was the one that attracted most attention, more particularly in places where school economies had to be effected. The experiment of alternating classes was tried in New York to relieve congestion in the schools. It was also tried in Kansas City and recommended for adoption in Somerville, Mass. In Sewickley, Pa., the Gary Plan was introduced with modifications, and in New York its various features were being much discussed in 1915–16.

The Gary Plan, viewed from another angle, aims to make the most of the school plant. By providing not only for the traditional school but also for the pupils' leisure time the school day is extended to the length of an ordinary working day—from about 8.30 to 5, with a brief interval at midday. The school is also open for voluntary attendance on Saturday from 9 to 5. All types of schools from the kindergarten up to the high school are under the same roof. It is claimed that this arrangement obviates time loss in passing from one type of school to another, remedies duplication or overlapping of studies, encourages pupils to continue in school beyond the required point, and provides a morally valuable interaction between the younger and older pupils. To meet all the activities contemplated school plants must comprise not only classrooms but also playgrounds, gardens, workshops, libraries, museums. These recreational and educational facilities may be placed at the disposal of the adult population in the evenings, so that the school becomes in a real sense the social centre of the community. Varied manual activities are carried to a stage of practical experience, for pupils of the upper elementary grades and of the high school gain prevocational training by assisting skilled craftsmen in the work that is associated with any large building —engineering, plumbing, painting, cabinetmaking, electric fitting, etc. Girls are trained in domestic science and art. Furthermore, there is opportunity, if the parents so desire, for children to spend one of the school periods at their own church, where religious instruction is provided. Prof. John Dewey gave the plan his unqualified endorsement.

The relation between the schools and the state is discussed under the headings EDUCATION and NATIONAL EDUCATION, SYSTEMS OF. The development of the school system in the United States is also treated under PUBLIC SCHOOLS. The local and general administration of schools and their relation to the government in respect to state support and state control is taken up in still greater detail in the articles on the various countries of the world, under the heading EDUCATION. See also COMMON SCHOOLS; CORRESPONDENCE SCHOOLS; DESIGN, SCHOOLS OF; EVENING SCHOOLS; GRAMMAR SCHOOLS; HIGH SCHOOLS; INFANT SCHOOLS; PUBLIC SCHOOLS; SECONDARY SCHOOLS; SUMMER SCHOOLS; SUNDAY SCHOOLS; VACATION SCHOOLS; with bibliography under these headings. For statistics, see UNITED STATES, *Educational Statistics of*. For architecture, see SCHOOL BUILDINGS.

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SCHOOLS, BROTHERS OF THE CHRISTIAN. Congregations of religious laymen established by the Catholic church for educational work. Among the more widely known are the Institute of the Brothers of the Christian Schools and the Irish Christian Brothers. The Christian Brothers of Ireland, or the Irish Christian Brothers, were founded at Waterford, Ireland, in 1802 by Edward Ignatius Rice, a merchant of that city. In 1820 the Pope approved of them as a religious body of the church. They spread into many countries from Australia to Newfoundland. Their educational work is of all kinds—primary, secondary, industrial. They have orphanages, homes for the deaf and dumb, and their colleges have maintained the highest order of excellence. The central government is at St. Mary's, Marino, Dublin. They came to New York in 1906. Consult: *American Catholic Quarterly* (Philadelphia, October, 1879); Azarias, *Educational Essays* (Chicago, 1896); *Catholic World* (New York, August, 1908). See BROTHERS OF THE CHRISTIAN SCHOOLS.

SCHOOLS, MEDICAL INSPECTION OF. The physical and mental examination of school children by a physician has for its object the detection of disease and deformity among them, the placing of those who are afflicted under conditions which will lead to cure or relief, and incidentally coöperation with the educational forces of the school in teaching personal hygiene. Its scope is even wider than this, for by it the message of hygiene of the person and the surroundings is transmitted to the home and particularly to the neglected homes of the poor and ignorant. Thus it benefits the family, improves citizenship, and becomes an important factor in the development of a better state. It is a new movement, at any rate in the United States, and is in line with the prevalent world impulse the ends of which are altruistic.

The rudiments of school hygiene were the subject of consideration in France as early as 1883, the outcome being the system of medical and san-

itary inspection promulgated in that country in 1886. A similar system was organized in Belgium in 1874, in Sweden in 1878, in Hungary in 1887, in Chile in 1888, in Germany in 1889, in Norway in 1891, in Japan in 1898, in Rumania in 1899. England did not pass the Medical Inspection Act until 1908. In New York the first inspector was appointed in 1892, in Boston in 1894, in Chicago in 1895, in Philadelphia in 1898. A system of inspection is now in operation in more than 400 of the cities in 20 of the States of the Union. It is not a detail of municipal administration alone; in several of the States it is established by compulsory laws. The need of examination not only of school children but of school buildings and surroundings is apparent quite as much in rural as in urban communities, but thus far the work has been limited to cities. The poorest schools, the poorest equipment, and the most complete disregard of sanitation are found in rural communities, but country children have the priceless benefit of pure air to offset these things. There are 20,000,000 school children in the United States, 20 per cent of the entire population, and three-quarters of them are said to be suffering from ailments more or less remediable. There are 500,000 who have some form of heart disease, 1,000,000 with tuberculosis, 1,000,000 with spinal curvature, 1,000,000 with defective hearing, 5,000,000 with defective vision, 5,000,000 who suffer from malnutrition, 6,000,000 with enlarged tonsils and adenoids, and 10,000,000 with bad teeth. There are 260,000 public-school buildings in the United States, valued at $850,000,000, conducted by 475,000 teachers, 70 per cent of whom are women, and costing $500,000,000 annually for their maintenance. The advantages and facilities provided in these schools vary widely, the best being in New York and Massachusetts and the poorest in Mississippi and Louisiana.

Of equal importance with the examination of the children is the inspection of the buildings. Such buildings should be approved by a competent health authority. Ohio and Minnesota now require such approval. If there is to be any distinction, the grammar schools, with their preponderance of children in the growing, rapidly changing period of life, should be superior in their appointments to the high schools. Buildings should be fireproof, with fire escapes, fire extinguishers, and fire drills. Entrances and exits should be of ample dimensions; they should be heated by steam or hot water, with a winter temperature of 65° F. to 68° F.; the air should be kept moist by the evaporation of water or the liberation of steam; suitable ventilators should furnish 30 cubic feet of fresh air per minute to each room, and all schoolroom windows should be opened during recess. Each room should be at least $30 \times 25 \times 13$ feet in dimensions and seat not more than 50 pupils, each pupil being allowed 15 square feet of floor space and 200 cubic feet of air space.

The acute infectious diseases are most frequently contracted during the early years of school life, and hence the first effort in the examination of school children should be the detection of these diseases. The eruption upon the skin in these diseases is frequently the first noteworthy symptom, and this may escape the notice of the parents or be disregarded by them. Children with such eruptions are occasionally seen even on the streets or in public conveyances, and it is therefore not strange that ignorant or careless parents should send them to school if they are not sick enough to be kept in bed. The work of the medical inspector at first was to discover such cases, place them in quarantine, and segregate those who had been in contact with them, the school being closed and disinfected if necessary. He also withdrew from attendance at school such cases of parasitic disease as are contagious and demand segregation and treatment, the list of those diseases including the itch, ringworm of the face and scalp, pediculi, trachoma, etc.

The advantages which resulted from this were so apparent that the necessity of examining the eyes was the next step, the number of cases of defective vision which were found and for which glasses were prescribed being astonishing. Then followed examinations for diseases of the ears, nose, throat, and finally the teeth. The ultimate result was the discovery of an amount of disease in school children which was appalling. A work so beneficent could not stop here; the children must receive treatment and be subjected to operations for these various ills; they must be directed to suitable dispensaries or hospitals, or they must receive attention at their homes, and this naturally led to greater elaboration of the system. Nurses were appointed to assist the doctors in their examinations, make suitable dressings, accompany children to dispensaries and hospitals, go to the children's homes, and not only give such attention to the children as the doctors prescribed, but teach the mothers lessons in practical hygiene.

The next problem which was taken up related to chronic diseases, deformities, and mental defects. Deformed and crippled children were separated from the others and placed under proper orthopædic supervision, the tuberculous and anæmic were sent to hospitals and sanitariums or directed to clinics, and the mentally defective and backward were assigned to special classes and teachers, no longer to act as a restraint to those who were mentally normal. Those who were imbecile were removed from the schools altogether and sent, when possible, to the appropriate State or municipal institution. The nutrition of multitudes of children was so bad that, whenever such a plan could be carried out, a wholesome daily lunch was served at a minimum cost or without charge to the very poor, the results showing improved physical and mental capacity. The final procedure consists in a complete physical examination, once or twice a year, of all the children in a school, the records being tabulated and preserved and forming a valuable contribution to vital statistics.

In most of the cities the inspector gives but a portion of his time to this work. The results are necessarily better when he can make this his exclusive occupation. The authority of the medical inspectors is derived in some cities from the local board of health, in others from the board of education, and in others from both.

This system is in reality a clearing house for disease in school children. It is principally for the benefit of the poor and the negligent, but it reacts favorably upon the entire body politic. Its importance is emphasized when we realize that 70 per cent of deaths in the United States are caused by contagious and infectious diseases. These diseases, especially prevalent among children, have been brought under observation and control as never before. Hospitals and dispensaries have long been numerous in the cities,

but they have never before been utilized for children to the same extent as now. In so important a matter as the care of the teeth little was formerly done for the children of the poor, to their great physical and mental detriment; now dental clinics for their benefit are being established in many cities, and dentists are being added to the staff of medical inspectors. Boston leads with the great Forsyth Dental Institution for poor children, costing $1,500,000.

As a summary showing what has been done in New York City alone, the medical inspectors in 1912 examined 287,469 of the 825,000 pupils in the public schools and found that nearly three-fourths of them required the services of a doctor or a dentist. It is thought that there are in all more than 426,000 public-school children in New York City with bad teeth, and these are associated in countless cases with deformed jaws, adenoids, indigestion, nasal breathing, and bad nutrition. If this be typical of the situation among urban school children in general, it indicates a rich field for the medical examiner.

Consult: L. H. Gulick and L. P. Ayres, *Medical Inspection of Schools* (New York, 1908); T. N. Kelynack, *Medical Examination of Schools and Scholars* (London, 1910); Russell Sage Foundation, *What American Cities are Doing for the Health of School Children* (New York, 1911); England, Board of Education, *Annual Report of the Chief Medical Officer* (London).

SCHOOLS, Naval. See Naval Schools of Instruction.

SCHOOL SAVINGS BANKS. A system of banks by which school children may be encouraged in habits of thrift. In nearly all European countries school children are encouraged to acquire the habit of saving through the device of savings banks maintained in connection with the schools. Commonly these institutions are associated in management and in the official reports with the postal savings banks. They have not been extensively introduced into the United States, partly, no doubt, because of the willingness of the ordinary savings banks (q.v.) to receive small deposits, and partly because in recent years the penny provident banks have fully met the demand for such a means of encouraging saving by children.

SCHOOL SHIP, Nautical. See Naval Schools of Instruction.

SCHOOLS OF COMPOSITION. See Music, History of.

SCHOOLS OF DESIGN. See Design, Schools of.

SCHOOLS OF LIBRARY ECONOMY. See Libraries.

SCHOONER (from *scoon, scun,* to skim, skip, from Norw. *skunna,* Icel. *skunda, skynda,* AS. *scyndan,* to hasten, OHG. *scuntan,* to urge on). A sailing vessel having two or more masts and wholly or chiefly fore-and-aft rigged. It is said to have been first designed by Capt. Andrew Robinson, of Gloucester, Mass., in 1713. A few schooners have a topsail and a topgallant sail on the foremast and are called topsail schooners. Some schooners carry a single yard on the foremast on which to set a square sail when desirable. But by far the greater number are wholly fore-and-aft rigged. The lower sails are bent to gaffs, booms, and hoops on the mast. There are usually two masts, but sometimes as many as seven. The schooner rig is distinctively American; its use abroad, until recently, was confined to quite small craft. See Sail; Yacht.

SCHOORLE, or **Schoreel, Jan van.** See Scorel, Jan van.

SCHOPENHAUER, shō'pen-hou'ẽr, **Arthur** (1788–1860). A German philosopher, born at Danzig, Feb. 22, 1788. He was the son of a rich banker and merchant, who determined to educate him to be a man of affairs and put him to school in France and afterward took him on travels through Belgium, England, France, and Switzerland. In 1805 he was placed in a business house in Hamburg, but soon afterward, on his father's sudden death, he was taken by his mother to Weimar, where he entered upon the study of classics, natural science, and philosophy. In 1809 he entered the University of Göttingen and devoted himself at first to medicine, but was soon attracted to philosophy, and in 1811 he went to Berlin to hear Fichte. In 1813 he took his degree at Jena on the since celebrated thesis, *Ueber die vierfache Wurzel des Satzes vom zureichenden Grunde.* In this treatise he distinguished between the principles of being, of becoming, of knowing, and of acting. These are respectively space and time, causality, logical ground, and motive. Schopenhauer spent the winter of 1813 at Weimar, where he enjoyed the society of Goethe, and devoted himself to studies in Oriental philosophy and in the theory of color. From 1814 to 1818 he lived at Dresden, occupied in writing a treatise on optics, *Ueber das Sehen und die Farben* (1816), and his magnum opus, *Die Welt als Wille und Vorstellung* (1819; 3d ed., 1859). He then traveled in Italy and returned to lecture for a short time in Berlin as privatdocent in 1820. Hegel was at that time the rage, and Schopenhauer found no success in lecturing against such a popular rival. After two years he returned to Italy, to stay three years more. But a renewal of philosophic interest recalled him in the south, and he again attempted to establish himself as a lecturer in Berlin. In a spirit of bravado he chose for his own lectures the hours when Hegel was drawing his crowds, but failed to furnish a sufficient counterattraction. In 1831 he settled in Frankfort-on-the-Main, where he spent many years in morose seclusion. He still worked in elaboration of his system and published *Ueber den Willen in der Natur* (1836), *Die beiden Grundprobleme der Ethik* (1841), and *Parerga und Paralipomena* (1851).

The last few years of his life were made happy for him by the homage of his admirers and by the calm which had come to his passionate nature with advancing years. He died in 1860, and the fame he had vainly longed for in life soon gathered around his memory. By temperament moody and despondent, irritable in temper, and violent in passions, he was well endowed to seize just those aspects of life which are the elements of a pessimistic philosophy. But the value of Schopenhauer's philosophy cannot be measured by any such method of personal criticism. His system, set forth in a literary form that, in the field of philosophy, has seldom been surpassed, and based on marvelous insight into the realities of life, falling in also with the disappointed mood of the age, has gained an acceptance that is, perhaps, greater than its real value warrants. Yet it has an abiding worth as emphasizing elements which a too optimistic philosophy did not sufficiently consider. The profound tragedy of life, the very real evil of the world, is ever present in his thought, though without sufficient balance. In this his thought

is akin to that of the ancient Hindu philosophies, with which he felt himself in close harmony, believing that he had accomplished a synthesis of their insight with Kantian thought. He accepted, with some qualification in details, Kant's view that the world of phenomena is a world of ideas (*Vorstellungen*); but instead of agreeing with Kant that the *Ding-an-sich* lies hopelessly beyond experience, he identified it with experienced will. But will is not limited by Schopenhauer to voluntary action with foresight; all the experienced activity of the self is will, ranging all the way down to unconscious physiological functionings. This will is the inner nature of each experiencing being and assumes in time and space the appearance of the body, which is an idea. Now, starting from the fact that the will is the inner nature of his own body as an appearance in time and space, Schopenhauer generalized to the conclusion that the inner reality of all material appearances is will, the ultimate reality is one universal will. With him the tragedy of life arises from the very nature of the underlying source of all existence, which is will, not intelligence—will, not in the ordinary sense of choice, but in the sense of activity, energy, impulse. This is not rational, since impulse is prior to reason. In its caprice (essentially incapable of reasoned action) it makes reason to be. Thus it is not reason that goes out into realization of itself in the world of persons and things, but impulse, which happens to realize itself in intelligence. Reason, thus, can never understand its own profounder source, since it is more and other than reason—is essentially irrational. It may modify impulse, may by resignation deny the will to live. The supreme wisdom of life is, therefore, what it has been (with differences) to such mystics as Thomas à Kempis and Gautama—resignation. This conception of the source of all life in will came to Schopenhauer through clear insight into the very nature of consciousness as essentially impulsive. His metaphysics is thus empirical, based on experience, arrived at by induction. Only a brief word can be given to Schopenhauer's plan of salvation. A temporary relief from the evil of life is to be found in the disinterestedness of artistic enjoyment; æsthetic pleasure does not rest on previous craving. But such relief is only a respite; permanent redemption can be had only in a moral life of unselfishness. In resolute altruism the self-seeking will is overcome. And altruism is not a *tour de force*. Once convince ourselves of the fundamental unity of will and, in devoting ourselves to others, we are really working for what is the most real in ourselves. See PESSIMISM; PHILOSOPHY.

Bibliography. His complete works were edited by Frauenstädt (Leipzig, 1873–74; 3d ed., 1891), by Grisebach (ib., 1891), and also by Warschauer (Berlin, 1891). Grisebach also published Schopenhauer's *Handschriftlicher Nachlass* (Leipzig, 1891–93). Many of his works have been translated into English. Of these may be mentioned: *The World as Will and Idea* (London, 1883–86); *Religion, a Dialogue, and Other Essays* (ib., 1889); *Two Essays: On the Fourfold Root of the Principle of Sufficient Reason; On the Will in Nature* (ib., 1889; 2d ed., 1897); *Selected Essays* (ib., 1891); *Studies in Pessimism* (ib., 1891); *The Wisdom of Life* (New York, 1891); *The Art of Literature* (ib., 1891); *Counsels and Maxims* (trans. by Saunders, ib., 1891). The literature on Schopenhauer is very extensive. For his life, consult: Wilhelm Gwinner, *Schopenhauer und seine Freunde* (Leipzig, 1863); Helen Zimmern, *Arthur Schopenhauer: His Life and his Philosophy* (London, 1876); William Wallace, *Life of Arthur Schopenhauer* (ib., 1890); Eduard Grisebach, *Schopenhauer: Neue Beiträge zur Geschichte seines Lebens* (Berlin, 1905); Johannes Volkelt, *Arthur Schopenhauer: seine Persönlichkeit, seine Lehre, sein Glaube* (3d ed., Stuttgart, 1907); Thomas Whittaker, *Schopenhauer* (New York, 1909); Wilhelm Gwinner, *Schopenhauers Leben* (3d ed., Leipzig, 1910). For his philosophy: Rudolf Lehmann, *Schopenhauer* (Berlin, 1894); William Caldwell, *Schopenhauer's System in its Philosophic Significance* (Edinburgh, 1896); S. S. Colvin, *Schopenhauer's Doctrine of the Thing-in-Itself* (Providence, 1897); Eduard von Mayer, *Schopenhauer's Aesthetik* (Halle, 1897); Edouard Rod, *Les idées morals du temps présent* (Paris, 1897); Kuno Fischer, *Schopenhauers Leben, Werke, und Lehre* (2d ed., Heidelberg, 1898); Oskar Damm, *Schopenhauers Ethik* (Annaberg, 1898); id., *Schopenhauers Rechts- und Staatsphilosophie* (Halle, 1901); Georg Simmel, *Schopenhauer und Nietzsche* (Leipzig, 1907); Nietzsche, *Schopenhauer as Educator* (Eng. trans. in vol. v of Nietzsche's *Complete Works*, 1910–14); André Fauconnet, *L'Esthétique de Schopenhauer* (Paris, 1913); Rieffert, *Die Lehre von der empirischen Anschauung bei Schopenhauer* (Halle, 1914).

SCHOPENHAUER, JOHANNA (1766–1838). A German author and mother of the philosopher Arthur Schopenhauer. She was born at Danzig. At the age of 27 she married the banker Heinrich Schopenhauer, with whom she traveled much. After his death she lived for a time in Weimar, where she gathered about her a brilliant circle of remarkable persons, among whom were Wieland and Goethe. Afterward she lived in Bonn and then in Jena. She wrote novels and descriptions of travel. *Gabriele* (1819) is considered her best book. Her complete works were published at Leipzig in 1830–31 in 24 volumes. Consult Düntzer, "Goethes erste Beziehungen zu Johanna Schopenhauer," in *Abhandlungen zu Goethes Leben*, vol. i (Leipzig, 1885).

SCHOPPE, shŏp'pe, KASPAR. See SCIOPPIUS, KASPAR.

SCHORL, shôrl. See HORNBLENDE.

SCHORLEMMER, shōr'lĕm-mĕr, CARL (1834–92). A German-English chemist, born at Darmstadt. He was educated at Darmstadt and at the University of Giessen. In 1859 he went to Owens College, Manchester, and there he was made assistant in chemistry in 1861 and professor of organic chemistry in 1874. Schorlemmer was the first to demonstrate by experiment that no compounds which would have contradicted the structural theory are really capable of existence, and thus he cleared the way for the establishment of one of the most useful theories of modern science, the theory of valency. (See VALENCY; TRIPHENYL-METHYL.) His publications include: *A Manual of the Chemistry of Carbon Compounds, or Organic Chemistry* (German and English, 1874); a voluminous *Systematic Treatise on Chemistry* (1877–98; 5th ed., rev., 1913), with Sir Henry Roscoe (q.v.); *The Rise and Development of Organic Chemistry* (1879), an historical work of considerable value. Consult Roscoe's sketch of Schorlemmer in the *Proceedings of the Royal Society* (London, 1889–93).

SCHOTT, shŏt, CHARLES ANTHONY (1826-

1901). An American civil engineer, born in Mannheim, Baden. He was educated at the Polytechnic School at Karlsruhe, went to the United States in 1848, and became permanently attached to the computing division of the United States Coast and Geodetic Survey. In 1855 he was appointed to supervise the magnetic work of the survey and became at the same time chief of the computing division, an office which he held until 1899. In 1899 he received the Wilde prize and 4000 francs from the Academy of France in recognition of his scientific writings, published in the documents of the Smithsonian Institution and the reports of the Coast and Geodetic Survey, which were considered the most important in the history of terrestrial magnetism. He was a member of the National Academy of Sciences and a founder of the Washington Academy of Sciences.

SCHOTT, shŏt, WALTER (1861–). A German sculptor. He was born at Ilsenburg in the Harz Mountains and studied under Dopmeyer at Hanover and at the Berlin Academy under Reinhold Begas. Of several graceful mythological and genre figures, a group of "Charity" and a "Girl Bowling" are especially noteworthy. His statues include those of Frederick William I in the Royal Palace, Berlin, of Albert the Bear in the Sieges-Allee, Berlin, the equestrian statue of Emperor William I at the Kaiserhaus in Goslar, and figures of angels on the dome of Berlin Cathedral. A series of candelabra with groups of animated figures, in the garden of the New Palace at Potsdam, well exemplify his sterling decorative work. His numerous busts are spirited in conception. He became professor in the Berlin Academy and was awarded gold medals at Berlin, Dresden, Munich, Antwerp, Chicago, and Vienna.

SCHOTT, WILHELM (1807–89). A German Orientalist. He was born at Mainz, studied at Giessen, Halle, and Berlin, and in 1838 became professor of Eastern Asiatic languages in the University of Berlin. He wrote many valuable works on the languages and literatures of Asia and Finland; chief among them are: *Buddhismus in Hochasien und in China* (1844); *Chinesische Sprachlehre* (1857); *Finnische und esthnische Heldensagen* (1866); *Zur Uigurenfrage* (2 parts, 1874–75); *Ueber die Sprache des Volkes Róng oder Leptscha in Sikkim* (1881).

SCHOTTISCHE, shŏt'ĭsh *or* shō-tēsh' (Ger., Scottish). A slow modern dance in $\frac{2}{4}$ time. Probably it was invented by Markowski, a well-known London teacher of dancing, and first danced in 1848. It is a round dance somewhat resembling the polka (q.v.).

SCHOULER, skōō'lĕr, JAMES (1839–). An American lawyer and historian, born at Arlington, Mass. He graduated from Harvard in 1859 and was admitted to the Massachusetts bar in 1862 and to that of the United States Supreme Court in 1867. From 1882 to 1902 he was professor of law at Boston University, from 1888 to 1908 nonresident professor of law in the National University at Washington, and from 1891 to 1908 lecturer on American history at Johns Hopkins. He served as president of the American Historical Association in 1897 and was elected to the National Institute of Arts and Letters. Among his many legal treatises are: *The Law of Domestic Relations* (1870); *The Law of Bailments* (1880); *The Law of Husband and Wife* (1882); *The Law of Executors and Administrators* (1883). His historical writings include: *Life of Thomas Jefferson* (1893); *Historical Briefs* (1896); *Constitutional Studies* (1896); *Eighty Years of Union* (1903); *Americans of 1776* (1908); *Ideals of the Republic* (1908). But it is upon his *History of the United States under the Constitution* (7 vols., 1880–1913) that Schouler's reputation as an historian chiefly rests. This work covers the period of American history from 1783 to 1877. In general the volumes are marked by good judgment and impartiality, but there are two notable exceptions: excessive sympathy is sometimes shown for Jefferson and Madison, and the Civil War is treated from an extreme pro-Northern standpoint. Throughout, Schouler sacrifices clearness to chronological order, and sometimes his style is rather clumsy. His references show excellent knowledge of the sources. Distinctly one of the best volumes is the last, published in 1913, in which the author aims to vindicate the character of President Johnson. Here, by the introduction of many personal reminiscences of the period of the Civil War and Reconstruction days, he adds much that is of value and interest.

SCHOUTEN, skou'ten, WILLEM CORNELIS (c.1567–1625). A Dutch navigator, born at Hoorn and long in the employ of the Dutch East India Company. Engaged in 1615 by the merchant Isaac Le Maire to find a western route to the East Indies, he set sail with his patron from Tekel, discovered the strait known by the name of the latter, separating Staten Island from the main island of Tierra del Fuego, and was the first to round Cape Horn, which he named after his birthplace. Since that time the outer route has been used by sailing vessels in preference to the inner passage.

SCHOUWEN, skou'en. One of the islands forming the Dutch Province of Zealand (q.v.).

SCHRADER, shrä'dĕr, EBERHARD (1836–1908). A German Orientalist, known especially for his work in Assyriology. He was born in Brunswick, studied at Göttingen under Ewald, and was successively appointed professor of theology at Zurich (1862), at Giessen (1870), and at Jena (1873), and in 1875 was called to the chair of Oriental languages in Berlin, where he became a member of the Academy. He wrote: *Studien zur Kritik und Erklärung der biblischen Urgeschichte* (1863); *Die assyrisch-babylonischen Keilinschriften* (1872); *Die Keilinschriften und das Alte Testament* (1872; 3d ed., 1902); *Die Höllenfahrt der Istar* (1874), text, version, and commentary; *Keilinschriften und Geschichtsforschung* (1878); *Zur Frage nach dem Ursprung der altbabylonischen Kultur* (1884); *Assyrisches Syllabar* (1893). He also edited the *Keilinschriftliche Bibliothek* (1889 et seq.), a collection of Assyrian and Babylonian texts and translations.

SCHRADER, JULIUS (1815–1900). A German historical painter. He was born in Berlin and studied at the Berlin Academy and in Düsseldorf under Schadow. At Rome he painted his first picture of significance, "The Capitulation of Calais in 1347" (1847, National Gallery, Berlin). Then followed "Frederick the Great after the Battle of Kolin" (1849, Leipzig Museum); "The Death of Leonardo da Vinci" (1851, Ravené Gallery, Berlin); "Parting of Charles I from his Family" (1855) and "Homage of Berlin and Cologne in 1415" (1874), both in the National Gallery, Berlin. Schrader also executed mural paintings in the Chapel Royal and

the New Museum, Berlin, and painted portraits. His pictures are good in color, but are in the theatrical styles of historical painting made popular by Delaroche and Gallait. He was a professor in and member of the Senate of the Berlin Academy.

SCHRADER, Otto (1855–). A German philologist, born at Weimar and educated at Jena, Leipzig, and Berlin. He was first a teacher in the Gymnasium at Jena (1879–87), and afterward became professor in the university there. In 1909 he was called as professor to Breslau. An authoritative writer on linguistic archæology, he is known by his *Handelsgeschichte und Warenkunde* (1887); *Sprachvergleichung und Urgeschichte* (1883; 3d ed., 3 vols., 1906–07; Eng. trans. by Jevons, 1890); *Reallexikon der indogermanischen Altertumskunde* (1901); edition of Hehn's *Kulturpflanzen und Haustiere in ihrem Uebergang aus Asien* (1902; 8th ed., 1911); *Die Indogermanen* (1911); *Die bedeutenden Sonnenfinsternisse und die grossen Mondfinsternisse für Mittel-Europa* (1913).

SCHRADER'S (shrä'dĕrz) **BROME GRASS.** See Rescue Grass.

SCHRADIECK, shrä'dĕk, Henry (1846–). A German violinist, born at Hamburg. He studied with Léonard at Brussels and with David at Leipzig. He taught at the Moscow Conservatory (1864–68) and later was concertmaster at Hamburg and at Leipzig. From 1883 to 1889 Schradieck was professor at the Cincinnati Conservatory, then returning to Germany as concert master of the Hamburg Philharmonic Society. In 1894 he again came to America to be professor at the National Conservatory and later occupied a similar position at the Broad Street Conservatory, Philadelphia. Among his works are *25 grosze Studien für Geige allein, Scale Studies, Technical Studies,* and *Guide to the Study of Chords.*

SCHRAUDOLPH, shrou'dôlf, Johann von (1808–79). A German religious painter, born at Oberstdorf. He studied under Schlotthauer in Munich, where he was employed by Cornelius in frescoing the Glyptothek and by Hess in the decoration of the All-Saints Chapel in the Basilica. In 1844 he received from King Ludwig I of Bavaria the important commission of decorating the entire cathedral of Speyer. The work occupied him nine years. Several altarpieces and easel pictures by him are in the New Pinakothek, Munich. His work, painted in the so-called cartoon (q.v.) style, shows sincerity of sentiment, but is weak in characterization and color.

SCHRAUF, shrouf, Albrecht (1837–97). An Austrian mineralogist, born and educated in Vienna. He was assistant curator (1861–67) and until 1874 curator of the Royal Museum of Minerals and then after 11 years as docent in the university became professor of mineralogy. He published: *Atlas der Krystall-Formen des Mineralreichs* (1864–78); *Lehrbuch der physikalischen Mineralogie* (1866–68); *Physikalische Studien* (1867); *Handbuch der Edelsteinkunde* (1869); *Mineralogische Beobachtungen* (1871–76); *Ueber den Einfluss des Bergsegens* (1894).

SCHREIBER, shrī'bĕr, Sir Collingwood (1831–1918). A Canadian railway engineer. He was born and educated in England, came to Canada in 1852, and in 1852–56 was employed on the engineering staff of the Toronto and Hamilton Railway. He practiced his profession in Toronto (1856–60), and subsequently was superintending engineer of the Northern Railway (1860–63), division engineer for the Nova Scotia government (1863–67), in charge of surveys on the Intercolonial Railway and chief engineer of government railways (1867–73). He succeeded Sir Sandford Fleming (q.v.) as chief engineer of the Canadian Pacific in 1880; was appointed chief engineer of the Department of Railways and Canals, Ottawa, and Deputy Minister of Railways and Canals, in 1892; and in 1905 was appointed general consulting engineer to the Dominion government and chief engineer of the western division of the National Transcontinental Railway. He was made K.C.M.G. in 1916.

SCHREIBER, shrī'bĕr, Heinrich (c.1500). A German mathematician, supposed to have been born at Erfurt. He wrote under the Greek name Grammateus, and by this he is generally known, but he was also known by his Latin name, Henricus Scriptor. He studied first at Cracow and in 1507 was a student at Vienna. He wrote an *Algorithmus Proportionum* which was published at Cracow in 1514. In 1518 he returned to Vienna, where he became a professor in the university. The lectures being discontinued (1512) on account of an epidemic, Schreiber returned to Nuremberg and Erfurt and wrote a work on arithmetic, *Behend unnd khunstlich Rechnung nach der Regel und welhisch Practic,* which was published at Nuremberg in 1521; an *Algorismus de Integris Regula de Tri cum Exemplis,* which was published at Erfurt in 1523; and *Eyn kurtz newe Rechenn unnd Visyrbuechleynn,* which came out at the same time as the *Algorismus.* It is from these works, decided contributions to German elementary mathematics, that he is chiefly known. He used the symbols + and −, though not the first to do so, and was the first, so far as known, to teach bookkeeping in the German language. Consult Smith, *Rara Arithmetica* (Boston, 1908).

SCHREINER, shrī'nĕr, Olive (Mrs. S. C. Cronwright Schreiner) (1862–1920). A British author, the daughter of a Lutheran clergyman sent as a missionary from England to South Africa, and sister of William Philip Schreiner. She was born in Basutoland. In 1894 she married S. C. Cronwright. When about 20 years old she visited England, taking with her the manuscript of her *Story of an African Farm.* After receiving the approval of George Meredith it was published with a few alterations in 1883 under the pseudonym of Ralph Iron and won instant success. It is best described as a spiritual autobiography representing the mental reaction by which an imaginative sensitive temperament passes from extreme Calvinism to hopeless atheism. Her other works include: *Dreams* (1891); *Dream Life and Real Life* (1893); *The Political Situation* (1895), with her husband; *Trooper Peter Halket* (1897). In the South African War Olive Schreiner's sympathies were with the Boers; her opinions will be found in *An English South African's View of the Situation* (1899). Her strong feminist convictions she expressed in *Woman and Labor* (1911).

SCHREINER, Oswald (1875–). An American agricultural chemist, born in Nassau, Germany. He was educated at the Baltimore Polytechnic Institute, at the Maryland College of Pharmacy (Ph.G., 1894), at Johns Hopkins (1894–95), and at the University of Wisconsin (B.S., 1897; Ph.D., 1902), where he was an instructor (1897–1903). Schreiner was chemist

of the United States Bureau of Soils in 1903–06 and thereafter chief of the Division of Soil Fertility Investigations. His publications include: *The Sesquiterpenes* (1904); *Colorimetric, Turbidity, and Titration Methods Used in Soil Investigations* (1906); *The Chemistry of Soil Organic Matter* (1910); *Lawn Soils* (1911); *The Organic Constituents of Soil* (1913); and various bulletins of the Bureau of Soils.

SCHREINER, William Philip (1857–1919). A South African politician. He was born in Cape Colony, a brother of Olive Schreiner. He was educated at Cape University, at London University, and at Downing College, Cambridge, of which he became a fellow and eventually honorary fellow. Called to the bar in 1882, Schreiner was legal adviser to the High Commissioner (1887–93) and in Cecil Rhodes's second ministry was Attorney-General. From 1893 to 1900 and from 1908 to 1910 he sat in the Cape Legislative Assembly, and in 1898–1900 he was Premier. His position was a particularly delicate one: he openly expressed opposition to Chamberlain and Milner; he made ineffectual personal appeals to Kruger; he refused to stop shipments of ammunition to the Free State. When the Boer War was impending he declared he would keep the colony neutral, if there were a war, but when war came he aided Milner. In 1908–09 Schreiner acted as counsel defending Dinizulu (see Zululand) when he was prosecuted for high treason. In 1910 he became a Senator of the new South African Union. He opposed the plan of segregation suggested in 1912 as a remedy for the growing power of the native blacks.

SCHREVELIUS, skrĕ-vĕ'lī-ŭs, Cornelis (c.1615–c.1664). A Dutch classical scholar, born at Haarlem and educated mainly by his father, whom he succeeded in 1664 as rector of the University of Leyden. His *Lexicon Manuale Græco-Latinum et Latino-Græcum* (Leyden, 1654) passed through many editions.

SCHREYER, shrī'ĕr, Adolf (1828–99). A German Oriental and military painter. He was born in Frankfort-on-the-Main, where he received his artistic training at the Städel Institute, later studying at Düsseldorf and Munich. After participating in the Crimean campaign as war artist and visiting Asia Minor and Algeria (1861) he settled in Paris, where he became a follower of Fromentin, depicting chiefly Oriental and military subjects in a style characterized by brilliant color effects and strong dramatic action. He is especially a painter of Arab horsemen, generally portraying them in fiery action, and their steeds with nostrils distended and manes flying in the wind. He received gold medals at Brussels (1863) and at Paris in 1864, 1865, and 1867. After the Franco-Prussian War he removed to Cronberg, near Frankfort. Four characteristic paintings are in the Metropolitan Museum, New York, two are in the Brooklyn Institute, and many other American collections possess examples of his work.

SCHRÖCKH, shrĕk, Johann Matthias (1733–1808). A German Church historian. He was born in Vienna, studied at Göttingen, became professor at Leipzig (1762) and at Wittenberg (1767). He is best known by his monumental *Christliche Kirchengeschichte* (35 vols., 1768–1803) and *Kirchengeschichte seit der Reformation* (10 vols., 1804–12), the last two volumes of which were added by H. G. Tzschirner. He also published *Allgemeine Biographie* (8 vols., 1767–91) and *Lebensbeschreibungen berühmter Männer* (1789–91). Consult his *Life* by *Tzschirner* (Leipzig, 1812).

SCHRÖDER, shrĕ'dĕr, Alwin (1855–). A German cellist, born at Neuhaldensleben. He received the appointment of first cello in Liebig's concert orchestra in 1875, occupied similar positions under Fliege and Laube at Hamburg, and in 1880 went to Leipzig as assistant to his brother Karl (q.v.), succeeding him in the Gewandhaus. In 1886 he went to Boston, where he became a member of the Kneisel Quartet and first cellist in the Boston Symphony Orchestra. In 1901 he resigned and went to Frankfort, but returned to Boston in 1908. In 1915 he succeeded Leo Schulz as cellist of the Margulies Trio.

SCHRÖDER, Friedrich Ludwig (1744–1816). A German actor and dramatist, born at Schwerin. He early became an actor and achieved great fame, especially in tragic rôles. He became manager of the theatre at Hamburg in 1771. His management was distinguished for the high artistic standard which he maintained in his company and particularly for his introduction of several of Shakespeare's tragedies to the German public, perhaps his own best rôle being that of Lear. His work as a dramatist consisted largely of adaptations from the English. Consult his *Dramatische Werke*, with an introduction by Tieck (Berlin, 1831), and Litzmann, *Friedrich Ludwig Schröder* (Hamburg, 1890–94).

SCHRÖDER, Karl (1838–87). A German gynæcologist, born in Neustrelitz and educated at Würzburg and Rostock. In Bonn he was assistant to Veit (1864–66) and docent, and in Erlangen he was from 1868 to 1876 professor and director of the lying-in hospital. From 1876 till his death he was professor in Berlin. He was a skillful and original operator and the first to practice ovariotomy successfully in Germany. He published a *Lehrbuch der Geburtshilfe* (1870; revised by Olshausen and Veit; Eng. trans. by C. H. Carter, *A Manual of Midwifery*, 1873) and *Handbuch der Krankheiten der weiblichen Geschlechtsorgane* (1874; revised by Hofmeier; Eng. trans. by E. W. Schauffler, T. F. Mundé, and others, *Diseases of the Female Sexual Organs*, 1875).

SCHRÖDER, Karl (1848–). A German cellist and composer, brother of Alwin Schröder. He was born at Quedlinburg and studied with Drechsler at Dessau and with Kiel at Berlin. In 1871 he organized with his three brothers the Schröder Quartet, but in 1873 he was appointed first cellist in the Brunswick Court Orchestra, in 1874 solo cellist in the Gewandhaus Orchestra at Leipzig, and in 1881 became court kapellmeister at Sondershausen. After 1866 he conducted successively the Opera at Amsterdam, Berlin, and Hamburg. He wrote a three-act opera, *Aspasia* (1892), a one-act opera, *Der Asket* (1893), a method and études for the cello.

SCHRÖDER, Sophie (1781–1868). A German actress. She was born at Paderborn, the daughter of an actor named Bürger. She appeared on the stage when only 12 years old, at St. Petersburg, where her mother was acting. Her second husband, to whom she was married in 1804, was the singer Friedrich Schröder. She acted in all the principal theatres in Germany and acquired a great reputation

by her impersonations of Phædra, Medea, Lady Macbeth, and other tragic characters. She retired from the stage in 1840 and resided then in Augsburg. Consult Schmidt, *Sophie Schröder* (Vienna, 1870).

SCHRÖDER-DEVRIENT, -de-vryän′, Wilhelmine (1804–60). A German dramatic soprano, born in Hamburg. She studied with Mazatti of Vienna and in 1821, at Vienna, sang the rôle of Pamina in *The Magic Flute*, in which her success was so great as to secure for her the part of Fidelio in 1822, in which rôle she won wide reputation. Although possessed of a magnificent voice, she was deficient in technique, a fault which was usually lost sight of in the intensity of her acting. Consult Richard Wagner, "Ueber Schauspieler und Sänger," in vol. ix of *Gesammelte Schriften und Dichtungen* (Leipzig, 1872).

SCHRÖDTER, shrē′tĕr, Adolf (1805–75). A German genre painter, engraver, and illustrator. He was born at Schwedt, Brandenburg, studied line engraving under Buchhorn and painting under Schadow, principally at Düsseldorf. There he became the satirist of the school, ridiculing its sentimentality in delightfully humorous paintings, engravings, and lithographs, which rapidly became celebrated. He designed series of such subjects as *Don Quixote*, *Münchhausen*, *Till Eulenspiegel*, and illustrated a number of works, the best known of which is perhaps Detmold's *Leben und Thaten des Abgeordneten Piepmeier* (1848). Among his best-known paintings are the "Wine Tasters" (1832) and a "Rhenish Tavern Scene" (1833), in the National Gallery, Berlin, and "The Sorrowful Tanners," a parody of Bendemann's "Lamentation of the Jews." He excelled in friezelike compositions, such as "The Four Seasons," executed in water colors (Karlsruhe Gallery). He was also notable as an etcher and published several works on art.

SCHROEDER, shrē′dĕr, Leopold von (1851–). A German Sanskrit scholar, born in Dorpat and educated there and at Jena and Tübingen. After having been docent at Dorpat (1877) he became professor at Innsbruck in 1894 and at Vienna in 1899. His most important work is the valuable and very condensed *Indiens Litteratur und Kultur* (1887). Besides he edited the *Māitrāyanī Saṁhitâ* (1881–86) and the *Kāṭhakam, die Saṁhita der Kāṭha-Cākhā* (2 vols., 1900–09) and published: *Griechische Götter und Heroen* (1887); the tragedy *König Sundara* (1887); *Worte der Wahrheit* (1892), a version of Buddhist proverbs; *Mangoblüten* (1892), poetical versions of Sanskrit songs and proverbs; *Prinzessin Zofe* and *Sakuntala* (1903), Indian dramas for the German stage; *Mysterium und Mimus im Rigveda* (1908); *Die Wurzeln der Sage von heiligen Gral* (1910); *Bei Vollendung der arischen Mysteriums in Bayreuth* (1911); *Arische Religion* (1914).

SCHROEDER, Seaton (1849–). An American naval officer, born in Washington, D. C. Graduating from the United States Naval Academy in 1868, he was a member of Commodore John A. Rodgers' expedition against the Korean forts in 1871, assisted in bringing the Egyptian obelisk to New York in 1879–80, and commanded the dynamite cruiser *Vesuvius* in 1890–93. In 1897–99 he served as executive officer of the *Massachusetts*, was promoted to commander in 1899, was naval governor of the Island of Guam and commander of the *Yosemite* in 1900–03, and became captain in the latter year. After serving three years as chief intelligence officer he commanded the *Virginia* in 1906–08 and, with the rank of rear admiral, was division commander (1908–09) and commander in chief of the Atlantic fleet. Although retired in 1911, he continued on special duty for two years. Schroeder is author of *The Fall of Maximilian's Empire* (1887) and of a number of essays.

SCHRÖTER, shrē′tĕr, Johann Hieronymus (1745–1816). A German astronomer, born at Erfurt. He studied law at Göttingen and in 1788 became chief magistrate at Lilienthal near Bremen, where he built and equipped an excellent observatory. There he made observations of the moon and planets until 1813, when his observatory and his writings were burned by the French.

SCHUBART, shōō′bärt, Christian Friedrich Daniel (1739–91). A German poet and musician, born at Obersontheim in Swabia. In 1763 he became a preceptor in Geisslingen, and six years afterward he was made director of music and organist in Ludwigsburg, but on account of quarrels and a parody he wrote upon the litany he was forced to leave. He led a restless and dissipated life at Heidelberg, Mannheim, Munich, Augsburg, and Ulm. At Augsburg he started in 1774 the *Deutsche Chronik*, a periodical, which met with universal favor in Germany. For 10 years, from 1777 to 1787, he was arbitrarily imprisoned in the fortress of Hohenasperg by Duke Charles of Württemberg. After his release he put himself under the protection of the King of Prussia and was made director of music of the court and theatre at Stuttgart. Though not belonging to the school of *Sturm und Drang*, Schubart possessed much of its spirit. While in prison he published an edition of his *Sämtliche Gedichte*. Among his finest single poems are "Die Fürstengruft" and "Hymnus auf Friedrich den Grossen." His complete works were published in eight volumes at Stuttgart in 1839–40. Consult E. Holzer, *Schubart als Musiker* (Stuttgart, 1905), and K. M. Klob, *Schubart: ein deutsches Dichter und Kulturbild* (Ulm, 1908).

SCHÜBELER, shụ′be-lēr, Fredrik Christian (1815–92). A Norwegian botanist, born at Fredriksstad. Educated at Christiania University as a physician, he practiced medicine, but turned to botany. With a government stipend he traveled through eight European countries, studying botanical gardens and museums, arboriculture and horticulture, and afterward held important positions as curator and professor at Christiania. His most important works are: *Havebog for Almuen* (1856; many editions); *Culturpflanzen Norwegens* (1862), later enlarged as *Die Pflanzenwelt Norwegens* (1873–75); *Synopsis of the Vegetable Products of Norway* (trans. by M. R. Barnard, 1862); *Kjökkenhaven, et Skrift for Folket* (1865; many editions; trans. into several foreign languages); *Viridarium Norvegicum* (3 vols., 1886–89).

SCHUBERT, shōō′bĕrt, Franz (1797–1828). A famous Austrian composer. He was born Jan. 31, 1797, in Vienna. His violin lessons began at the age of eight. A few lessons from an elder brother, Ignaz, sufficed to start him on the pianoforte, and he continued to study by himself. In 1808 he passed his examination for the court choir. The manuscript of a piano duet, *Leichenfantasie*, after Schiller, bears date April 8–May 1, 1810. He was not then 14; the

next year was important in his development as a composer, for from it date his first songs, "Hagar's Klage" and "Der Vatermörder." Salieri, who was one of the instructors at the Stadtkonvikt, where Schubert received a general schooling, was so struck with "Hagar's Klage" that he made arrangements for Ruczizka to give the boy lessons in harmony. At this time Franz already had composed chamber music, which he took home with him on holidays and tried over in the family circle.

In 1813 he began work on an opera, *Des Teufels Lustschloss*, and composed a symphony. During this year his voice broke, and he was obliged to leave the choir. Some of his most important compositions were written during this period—between his seventeenth and twentieth years. At this time, too, he formed a close attachment for Mayrhofer, whose melancholy disposition was the very opposite of Schubert's joviality. Of *Des Teufels Lustschloss*, finished in 1814, only the first and third acts remain. The composer gave the score to Josef Hüttenbrenner for a small debt, and in 1848 a servant lit the fire with the second act. One of his best masses, that in F, dates from this year.

In 1816, when he was only 19 years old, he wrote two of his most famous songs, "The Erlking" and "The Wanderer." Josef Spaun, who had provided him with music paper at the choir school, chancing to call upon him one afternoon, found him working excitedly over Goethe's poem. The very same evening the composer appeared at the school with the finished song. It seems incredible at this day that five years should have elapsed before this immortal song was heard in public, yet such was the case. Previously, however, it had been sung frequently in private. To the "Erlking" year belongs, besides many other compositions, the *Tragic Symphony*. Although his application for the post of musical instructor in Laibach was unsuccessful, he was able to obtain freedom from the drudgery of teaching through the generosity of one of his admirers, Franz von Schober, the latter a student at the University of Vienna, who recognized Schubert's genius and invited the composer to live with him.

In 1818 Count Johann Eszterházy offered Schubert the post of music teacher in his family, with a residence in winter in Vienna and in summer at Zelész in Hungary. This arrangement, however, did not last long, for early in 1819 Schubert was sharing quarters in Vienna with another friend, Mayrhofer.

The first public performance of a song by Schubert appears to have been at a concert in 1819, when the "Schäfer's Klagelied," sung by Franz Jäger, a tenor, was received with applause. Vogl induced the management of the Kärnthnerthor Theater to commission Schubert to set to music the farcical *Die Zwillingsbrüder*. It was produced in June and had six repetitions, without, however, making a decided impression.

Despite the admiration for Schubert's many compositions, up to 1821 none had been published. In that year Leopold von Sonnleithner put an end to the disgraceful neglect.

He took "The Erlking" to the publishing houses of Diabelli and Haslinger. Both absolutely declined it, giving as reasons that the composer was unknown and that the accompaniment was too difficult. Sonnleithner then persuaded three others to share the expense with him and had the song printed by Diabelli on commission. Other songs of his now were published and sold well, and he would have found himself in comfortable circumstances had he not been without business instinct.

In December, 1823, he finished the opera *Alfonso und Estrella*. The libretto is by Schober, and it is said that Schubert set Schober's lines to music as rapidly as the librettist wrote them. The opera was not brought out until 1854, when Liszt produced it at Weimar, but unsuccessfully, largely owing to the wretched libretto. One of Schubert's finest works, the *Unfinished Symphony*, dates from this period. This fragment consists of the first and second movements, which are familiar to concert goers, and nine bars of the scherzo. These are fully scored, but with them the manuscript comes to a complete stop, not even the most meagre sketch of the remainder having been discovered. This exquisite fragment was not heard until 1865, when it was performed in Vienna. Some incidental music written for *Rosamunde, Princess of Cyprus*, pleased greatly; but Schubert's genius seems to have been too lyric for opera, and of his few stage works which have been heard only the little opera *Der häusliche Krieg*, which remained unknown until 1861, when it was brought out in Vienna, has had any success. The year 1823 is noteworthy for the composition of his charming song cycle *Die schöne Müllerin*.

During the few remaining years of his brief life he composed several of his finest works, most notable among them his great symphony in C. He presented the score to the Gesellschaft der Musikfreunde, of Vienna, in return for a purse of 100 florins, which they had voted him. They placed the symphony in rehearsal, but abandoned it as too difficult. The score was discovered in 1838 in Ferdinand Schubert's possession by Schumann and by him sent to Mendelssohn, who produced it at a Gewandhaus concert, Leipzig, March, 1839. On Nov. 4, 1828, Schubert called on the court organist, Sechter, to arrange for lessons in counterpoint. Soon afterward he took to the bed from which he never rose. "Die Taubenpost," the last of the *Schwanengesang*, composed in October, 1828, is generally regarded as his last composition. In the early stages of his final illness (typhoid) he gave some time to correcting the proof sheets of his song cycle *Die Winterreise*. He died November 19 and was buried near Beethoven's grave.

Of the modern song (*Kunstlied*) Schubert is not only the originator, but, to this very day, the unsurpassed master. Development, and even advance in certain directions, there undoubtedly has been. Yet Schubert is not equaled by any of his successors in spontaneity, wealth of melody, and universality of expression. As Schumann truly said: "He has strains for the most subtle thoughts and feelings, nay even for the very events and conditions of life; and innumerable as are the shades of human thought and aspiration, so various is his music. Whatever his eye beholds, whatever his hand touches, turns into music. He was the greatest after Beethoven, who, a sworn enemy of philistinism, practiced music in the highest sense of the word." Schubert's songs range from the simplicity of the folk song to the height of symphonic power, and many of the greatest were written before the composer had reached his twentieth year. The number of his songs now known exceeds 600.

Had Schubert written nothing but these songs,

he would still be among the immortals. But also in the field of instrumental music he has left imperishable masterpieces. And here a remarkable fact must be noted. In his case the development of the song writer preceded that of the instrumental composer. While he wrote such masterpieces as "The Erlking" and "The Wanderer," his numerous instrumental works still show the influence of his predecessors. In this field he speaks his individual language for the first time in the great *Unfinished Symphony in B minor* (1822). Besides the two famous symphonies mentioned he wrote seven others. His chamber music comprises 14 string quartets, a string trio, two piano trios, the famous piano quintet, op. 114, and octet for strings, horn, clarinet, and bassoon. Among the works for piano the 15 sonatas rank very high. In the field of sacred music he wrote an oratorio, *Lazarus* (unfinished), six masses, and numerous smaller choruses. Among the choral works the most important are: *Miriams Siegesgesang; Nachtgesang im Walde; Glaube, Hoffnung und Liebe; Schlachtgesang.* Of his 17 operas none achieved a lasting success.

A complete edition of Schubert's works in 40 volumes, edited by E. Mandyczewski, was published by Breitkopf and Härtel (1885–97).

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SCHUBIN, shōō'bĭn, Ossip. See Kirschner, Aloisia.

SCHUCH, shōōg, Werner (1843–). A German historical and portrait painter, born at Hildesheim. He studied architecture at the Polytechnic Institute of Hanover, and after practicing his profession as architect and engineer for some years studied painting at Düsseldorf and Munich and finally settled in Berlin. His historical compositions, which are in many German galleries, include: "From the Time of Dire Need" (1877), "General Zieten at Hennersdorf" (1886), "General Seydlitz at Rossbach" (1886), "Battle of Möckern" (1895), all in the National Gallery at Berlin. Among his portraits are those of "Emperor William II on Horseback" (Berlin Gallery), the Crown Prince (1907), and "The Crown Princess Reviewing a Dragoon Regiment" (1910).

SCHUCHARDT, shōōg'ärt, Hugo (1842–). A German Romance philologist, born at Gotha and educated in the universities of Jena and Bonn. After spending three years as docent at Leipzig, in 1873 he was appointed professor of Romance philology at Halle, whence he was called in 1876 to Graz. He retired in 1900. His publications include: *Vokalismus des Vulgarlateins* (3 vols., 1866–68); *Ritornell und Terzine* (1875); *Slawo-Deutsches und Slawo-Italienisches* (1884); *Romanisches und Keltisches* (1886); *Baskische Studien* (1893); *Weltsprache und Weltsprachen* (1894); *Kreolische Studien* (1881–91); *An A. Mussafia* (1905); *Baskisch und Romanisch* (Halle, 1906); *Die iberische Deklination* (1907).

SCHUCHERT, shŭk'ĕrt, Charles (1858–). An American paleontologist, born at Cincinnati, Ohio. After receiving a public-school education he became a collector of fossils and student of paleontology, served on the geological survey of Minnesota in 1891–92, and then spent a year in the preparation of fossils with C. E. Beecher of Yale. He was assistant paleontologist of the United States Geological Survey (1893–94) and assistant curator of the United States National Museum (1894–1904) and thereafter held chairs in Yale College and in the Sheffield Scientific School and the curatorship of the geological collections in the Peabody Museum. Schuchert served as president of the Paleontological Society in 1910. In the same year he was elected to the National Academy of Sciences. He received an honorary A.M. from Yale in 1904 and an LL.D. from New York University in 1914. His publications include *Directions for Collecting and Preparing Fossils* (1895) and *Revision of Paleozoic Stelleroidea* (1915).

SCHÜCK, shŭk, Johan Henrik Emil (1855–). A Swedish historian of literature, born in Stockholm and educated at Upsala, where he gained the doctorate (1882). He became professor of ethics and of the history of literature and art at Upsala in 1898, and rector of the university in 1905. Among his works are: *William Shakespeare, hans lif och verksamhet* (1883–84), a study of the original sources; *Svensk litteraturhistoria,* vol. i (1885–90), a learned work of large scope; *Illustrerad Svensk litteraturhistoria* (2 vols., 1895–96; 2d ed., 1912), with K. Warburg; *Världslitteraturens historia,* vols. i, ii (1898–1906); *Studier i Nordisk litteratur och religionshistoria* (2 vols., 1904); *Gustaf III, en karaktärstudie* (1904); *Ur gamla papper* (1892–94), essays. With A. Noreen he edited old ballads, *1500–och 1600–tallets visböcker,* vol. i (1884–94); with O. Levertin, *Svenska memoarer och bref* (1900–04); and alone edited *Excellencen A. F. Skjöldebrands memoarer* (5 vols., 1904–05). Schück is considered one of the foremost literary historians produced by Sweden.

SCHÜCKING, shŭk'ĭng, Lævin (1814–83). A German novelist, born near Münster. He studied law at Munich, Heidelberg, and Göttingen, but after returning to Münster gave up the law for letters. He became acquainted with the poet Annette von Droste-Hülshoff (q.v.), who took an interest in his career. His first efforts, published in 1842, were descriptive: *Das malerische und romantische Westfalen* (begun by Freiligrath) and *Der Dom zu Köln und seine Vollendung.* In 1843 he went to Augsburg as one of the editors of the *Allgemeine Zeitung,* and thence he removed to Cologne to join the staff of the *Kölnische Zeitung.* His numerous novels include: *Die Ritterbürtigen* (1845); *Ein Sohn des Volkes* (1849); *Der Bauernfürst* (1851); *Paul Bronckhorst* (1858). After his death appeared *Lebenserinnerungen* (1886). Although not profound, these works are wholesome and agreeable.

His wife (1815–55), known by her pen name

Luise von Gall, was born in Darmstadt. She published her first volume, *Frauennovellen*, in 1844, and this was followed by the novels *Gegen den Strom* (1851) and *Der neue Kreuzritter* (1853). She was also the author of a successful comedy, *Ein schlechtes Gewissen* (1842).

SCHULMAN, shōōl'mȧn, Kalman (1819–99). A modern Hebrew writer and translator, born in the Province of Mohilev, Russia. His compilations include a universal history in nine volumes, a 10-volume general geography, and a number of historical works; his most popular work, however, was his Hebrew rendering of Eugène Sue's *Mystères de Paris* (1857). His literary activity had a double purpose, to revive the use of the classical Hebrew tongue and to arouse an interest in secular knowledge among the Jews.

SCHULMAN, Samuel (1864–). An American rabbi. He was born in Russia, but was brought to America when he was four years old. In 1885 he graduated from the College of the City of New York and in 1885–89 studied at the University of Berlin. He served as rabbi in New York City in 1889, at Helena, Mont., in 1890–93, and in Kansas City, Mo., in 1893–99. In the latter year he became minister of Temple Beth-El in New York. He received the degree of D.D. from the Jewish Theological Seminary of America in 1904. Dr. Schulman served on the board of editors of the English translation of the Bible for the Synagogue and is author of many special articles and contributions on religious subjects.

SCHULTE, shul'te, Johann Friedrich, Knight von (1827–1914). A German jurist, born at Winterberg, Westphalia. In 1854 he became professor of canon law at Prague. His opposition to the doctrine of papal infallibility, as consistorial councilor, attracted much attention and brought him the criticism of many coreligionists. In 1873 he became professor at Bonn. From 1874 to 1879 Schulte was a member of the German Reichstag, where he voted with the National Liberals. In 1906 he retired from active life. He was considered an authority on canon law. His publications include: *Die Geschichte der Quellen und Literatur des canonischen Rechts* (1875–80); *Lehrbuch des katholischen und evangelischen Kirchenrechts* (1886); *Lehrbuch der Deutschen Reichs- und Rechtsgeschichte* (1892); *Lebenserinnerungen* (1908–09).

SCHULTENS, skul'tĕns, Albert (1686–1750). A Dutch Orientalist. He was born in Groningen, studied there, at Utrecht, and at Leyden, and after two years as pastor at Wassenaar, near Leyden, in 1713 became professor of Oriental languages at Franeker, whence in 1729 he removed to Leyden. There he became professor of Arabic—the study of which he insisted was a necessary adjunct to Hebrew—and of Hebrew antiquities. He was the first comparative philologist in Semitics and wrote: *Origines Hebrææ* (1724–38); *Institutiones ad Fundamenta Linguæ Hebrææ* (1737); the unfinished *Institutiones Aramææ* (1745–49); and versions, with commentaries, of Job (1737) and of the Book of Proverbs (1748). His *Opera Minora* appeared in 1769.

SCHULTZ, shults, Hermann (1836–1903). A German Protestant theologian, born at Lüchow, Hanover. He was educated at Göttingen, where he was an instructor (1861–64), and at Erlangen. Schultz became a professor at Basel in 1864, at Strassburg in 1872, at Heidelberg in 1874, and at Göttingen in 1876. In 1881 he was also chosen consistory councilor and in 1890 abbot of Bursfelde. His writings include: *Zu den kirchlichen Fragen der Gegenwart* (1861); the important *Alttestamentliche Theologie* (2 vols., 1869–70; 5th ed., 1896; Eng. trans. as *Old Testament Theology*, 2d ed., 1895); *Die Stellung des christlichen Glaubens zur heiligen Schrift* (1876; 2d ed., 1877); *Die Lehre von der Gottheit Christi* (1881); *Predigten* (1882); *Grundriss der evangelischen Dogmatik* (1890; 2d ed., 1892); *Grundriss der evangelischen Ethik* (2d ed., 1897); *Grundriss der christlichen Apologetik* (2d ed., 1902; Eng. trans., 2d ed., 1905).

SCHULTZ, Sir John Christian (1840–96). A Canadian administrator, born at Amherstburg, Ontario, and educated at Oberlin College, Ohio, and in medicine at Queen's and Victoria universities. In 1860 he removed to Fort Garry (now Winnipeg), where he began the practice of his profession. He also owned and edited the *Nor'Wester*, the pioneer newspaper of the Canadian West. In Riel's Rebellion (1869–70) Schultz was imprisoned and condemned to death by Riel, but escaped and went to Toronto. From 1871 to 1882 he was a member of the Dominion House of Commons, was a Dominion Senator in 1883–88, and from 1888 to 1895 Lieutenant Governor of Manitoba. In 1895 he was knighted (K.C.M.G.).

SCHULTZE, shul'tse, Fritz (1846–1908). A German philosopher, born at Celle and educated at Jena, Göttingen, and Munich. He was professor extraordinary of philosophy at Jena in 1875–76 and in the latter year became professor of philosophy and pedagogy in the Royal Polytechnic Institute of Dresden. Among his works may be named: *Der Fetischismus* (1871); *Geschichte der Philosophie der Renaissance* (vol. i., 1874); *Philosophie der Naturwissenschaft* (1881–82); *Stammbaum der Philosophie* (1890; 2d ed., 1899); *Der Zeitgeist in Deutschland, seine Wandlung im 19. und seine muthmassliche Gestaltung im 20. Jahrhundert* (1894); *Psychologie der Naturvölker* (1900); *Credo und Spero* (1906).

SCHULTZE, Max Johann Sigismund (1825–74). A German anatomist and cytologist, born at Freiburg in Breisgau. He studied medicine at Greifswald and Berlin. In 1854 he was appointed adjunct professor in Halle and in 1859 was called to the chair of anatomy in the University of Bonn. His chief works are: *Beiträge zur Naturgeschichte der Turbellarien* (1851); *Beiträge zur Kenntnis der Landplanarien* (1857); *zur Kenntnis der elektrischen organe der Fische* (1858); *zur Anatomie und Physiologie der Retina* (1866). His most notable contribution to general biology was his work on the nature of protoplasm and of cells. (See Cell.) He was the first, after Dujardin, to establish the nature of protoplasm of rhizopods and to show that it was the fundamental substance of both animals and plants. His results are embodied in his tract *Das Protoplasma der Rhizopoden und der Pflanzenzellen: ein Beitrag zur Theorie der Zelle* (1863). He adopted Mohl's term "protoplasm," applied by that botanist to plants alone, and extended it to include that of animals. Schultze was also the founder and editor of the *Archiv für mikroskopische Anatomie*, begun in 1865.

SCHULZ, shults, Albert (1802–93). A German writer on mediæval literature, especially the

Arthurian legends, born at Schwedt. His valuable studies in his special field, published under the pseudonym San Marte, include a version of the "Parzival" in *Leben und Dichten Wolframs von Eschenbach* (1836–41); other works on Wolfram's "Parzival"; *Die Arthursage* (1842); *Nennius und Gildas* (1844); *Beiträge zur bretonischen und keltischgermanischen Heldensage* (1847); *Rückblicke auf Dichtungen und Sagen des deutschen Mittelalters* (1872).

SCHULZ, JOHANN ABRAHAM PETER (1747–1800). A German composer, born at Lüneburg. He studied with Kirnberger at Berlin, taught there, and became musical director at the French theatre in 1776, holding the appointment for two years. In 1780 he became kapellmeister to Prince Heinrich at Rheinsberg and afterward was conductor at Copenhagen. He published: *Gesänge am Clavier* (1779) and *Lieder im Volkston* (1782), which were printed together, with augmentations, as *Lieder im Volkston* (1785); *Chansons Italiennes* (1782); operettas and operas; the oratorio *Johannes und Marie;* and the passion cantata *Christi Tod.*

SCHULZE, shŭl'tse, ERNST (1789–1817). A German poet, born at Celle. He studied theology at Göttingen, but afterward devoted himself to philology. The death of Cäcilie Tychsen (1812), in whose memory his epic *Cäcilia* (1818) was written, clouded all his later life. His writings are Romantic in style and mainly in allegorical form. The epic *Die bezauberte Rose* (1818), his last work, is a poem of classic beauty of style. *Sämtliche poetische Werke* were edited by Bouterwek (3d ed., with biography by Marggraff, Leipzig, 1855).

SCHULZE, FRANZ EILHARD (1840–). A German zoölogist, born at Eldena, near Greifswald, and educated at Rostock and Bonn. From 1863 to 1873 he was privatdocent and professor at Rostock, then professor at Graz until 1884, and afterward at Berlin was professor of zoölogy and director of the Zoölogical Institute. In 1871, while at Rostock, he sailed in the Pomeranian expedition. He did important work on hydroids and sponges and after 1897 was editor of *Das Tierreich.*

SCHULZE, FRIEDRICH AUGUST (1770–1849). Pseudonym, Friedrich Laun. A German novelist, born in Dresden. His first novel, *Der Mann auf Freiersfüssen* (1801), was favorably received, but his numerous works as a whole are without particular value. With Apel he edited a *Lustspiele* (1807), *Gespensterbuch* (1810–14), and *Gedichte* (1824).

SCHULZE, FRIEDRICH GOTTLOB (1795–1860). A German economist, born at Obergävernitz, near Meissen, Saxony, and hence called Schulze-Gävernitz. He was educated at Leipzig and Jena, became professor in the latter university in 1821, and, after founding there an agricultural institute, the first connected with a German university, in 1832 went to Greifswald, where he established a similar training school in Eldena. These institutions exercised great influence on agriculture throughout Germany. In 1839 he returned to Jena. Schulze wrote *Deutsche Blätter für Landwirtschaft und Nationalökonomie* (1843–59), *Nationalökonomie oder Volkswirtschaftslehre* (1856), and the posthumous *Lehrbuch der allgemeinen Landwirtschaft* (1863). A memorial to him was erected at Jena in 1867.

SCHULZE-DELITZSCH, -dā'lĭch HERMANN (1808–83). A German economist and sociologist, the founder of the German coöperative movement. He was born at Delitzsch, studied jurisprudence at the universities of Leipzig and Halle, and subsequently held judicial positions at Naumburg and Berlin, playing a prominent part in the liberal movement of 1848–49 in Prussia. Schulze-Delitzsch advocated coöperation and devoted himself to the establishment of coöperative associations which should secure to the laborers the benefits of the wholesale market. Coöperative banks were also established, which lent money on moderate terms. He endeavored to accustom the people to rely upon their own initiative to improve their condition. He declared that the function of the state should be limited to assuring industrial and personal liberty. Schulze-Delitzsch's writings are chiefly in the form of pamphlets. His most important doctrines are embodied in *Information on Professional and Labor Associations* (1850); *Manual of Association for Artisans and German Workmen* (1853); *Suppression of Social Reform by Lasalle* (1866); *Social Rights and Duties* (1867); *Development of Coöperative Associations in Germany* (1870). Consult Bernstein, *Schulze-Delitzsch: Sein Leben und Wirken* (Berlin, 1879).

SCHULZE-GÄVERNITZ, gā'vĕr-nĭts, GERHART VON (1864–). A German economist, born in Breslau and educated at Heidelberg. He became professor of political economy at Freiburg in 1893. He wrote *Zum sozialen Frieden* (1890); *Thomas Carlyles Welt- und Lebens-Anschauung* (1893); *Volkwirtschaftliche Studien aus Russland* (1899); *Britisher Imperialismus und Englischer Freihandel zu Beginn des 20ten Jahrhunderts* (1906); *England und Deutschland* (2d ed., 1908).

SCHUMACHER, shōō'mäg-ĕr, HEINRICH CHRISTIAN (1780–1850). A Danish astronomer, born at Bramstedt, Holstein. He studied at Kiel, Jena, Copenhagen, and Göttingen. In 1810 he became adjunct professor of astronomy in Copenhagen. In 1813 he was appointed director of the Mannheim observatory and in 1815 professor of astronomy and director of the Copenhagen observatory. In 1822 he published tables of the distances of Jupiter, Saturn, Mars, and Venus from the moon. In 1822 he began the publication of the *Astronomische Nachrichten,* of which he published 32 volumes. This has been continued in an unbroken series and is regarded as perhaps the most important of astronomical periodicals. Schumacher also published, in coöperation with other eminent astronomers, *Astronomisches Jahrbuch* (1836–44).

SCHUMACHER, HERMANN A(MANDUS) (1868–). A German economist, born in Bremen. He spent part of his youth in America, received his early education in New York City, went to the Bremen Gymnasium, and attended the universities of Freiburg, Munich, Vienna, and Berlin. In 1893, under a grant from the Imperial Chancery, he studied the American cereal trade and in 1895 published a book on this subject. He was a member in 1897–98 of a German commission investigating the industrial conditions of eastern Asia. In 1899 he became professor at the University of Kiel, in 1901 director of the Cologne School of Commerce, and in 1904 professor of economics at Bonn. In 1906 he was the first German exchange professor at Columbia University. Schumacher traveled in Java, Sumatra, and Malaysia in 1911. From Columbia University he

received the degree of LL.D. Besides his books on American grain trade and grain exchanges and on Eastern Asiatic (especially Chinese) trade, he wrote: *Private Banking in Germany and the Causes of its Concentration* (1907); *Industrial Insurance* (1907); several volumes (in German) on banking, iron industry, etc.; and *Deutsche Volksernährung und Volksernährungspolitik im Kriege* (1915).

SCHUMACHER, Peder, Count Griffenfeld. See Griffenfeld.

SCHUMANN, shōō'män, Georg Alfred (1866–). A German composer and choral conductor, born at Königstein. He received his first musical instruction from private teachers in Dresden and then was a pupil of the Conservatory at Leipzig from 1882 to 1888. In 1890 he became conductor of the Gesangverein at Danzig, in 1896 went to Bremen as director of the Philharmonie, and in 1900 succeeded Blumner as conductor of the Singakademie in Berlin. As a composer he attracted attention through his oratorio *Ruth* (1908). His other compositions include the choral works *Amor und Psyche* and *Preis und Danklied*, a symphony in B minor, the overtures *Liebesfrühling* and *Zu einem Drama*, a *Serenade*, an orchestral *Suite*, chamber music, piano pieces, songs.

SCHUMANN, Klara (1819–96). A German musician and composer, one of the greatest concert pianists of her generation. She was the daughter of Frederick Wieck (q.v.), from whom she received her musical education. At 13 she began the concert tours which made her famous and which led to her acquaintance with Robert Schumann (q.v.) and to their marriage. After the death of her husband she lived for several years in Berlin and during this period wrote some of her most charming songs. From 1878 to 1892 she served on the faculty of the Hoch Conservatorium at Frankfort. Her compositions are largely in the style of her husband's. They include: Op. 12, 12 poems by Rückert, set to music by Robert and Klara Schumann (Nos. 2, 4, and 11 by the latter); a pianoforte concerto (op. 7); a trio (op. 17); the violin romances (op. 22); and several preludes, fugues, variations, and exercises. Consult: B. Litzmann, *Klara Schumann: Ein künstlerleben* (3 vols., Leipzig, 1905–08; translated and abridged by G. E. Hadow, ib., 1913); W. Kleefeld, *Klara Schumann* (Bielefeld, 1910); F. May, *The Girlhood of Clara Schumann* (London, 1912).

SCHUMANN, Max (1827–89). A Prussian military engineer, famous for his efforts to utilize armor plate in warfare. He was born in Magdeburg. At the time of the American Civil War he became interested in the subject of armored fortifications, which he proceeded to study in England (1863–65). During the Franco-Prussian War he was on fortification duty, and in 1872 he retired, immediately entering the Gruson works. There he devised an armored gun carriage, an armored mortar platform, a disappearing carriage, and a steel wire net for defense. A rotary ironclad tower planned by him was adjudged at Bucharest (1885–86) superior to that of Mougin. The fortifications of Rumania and Switzerland (1889–94) were erected according to his theories, also the harbor fortifications of Copenhagen (1886–93). Schumann described the salient features of his innovations in *Die Bedeutung drehbarer Geschützpanzer für eine durchgreifende Reform der permanenten Befestigung* (2d ed., 1885), and "Die Panzerlafetten und ihre fernere Entwickelung," in the *Internationale Revue* (1886). Consult Schröder, *Schumann und die Panzerfortifikation* (Berlin, 1890).

SCHUMANN, Robert (1810–56). A famous German composer. He was born at Zwickau, Saxony, where his father was a bookseller and publisher. At Zwickau he received piano lessons from a pedantic teacher, Kuntzsch. Until he was 21 years old he had no instruction in composition. He then placed himself under Heinrich Dorn at Leipzig. He had begun to compose, however, according to his own statement, when he was 11 years old, setting the 150th Psalm to music. His mother being opposed to his choosing a musical career, Robert in 1828 matriculated at the University of Leipzig as a law student. Most important at Leipzig was his acquaintance with Friedrich Wieck, a gifted musician, and his daughter Klara, then in her ninth year and a surprisingly skillful pianist. Schumann placed himself under Wieck's instruction, afterward entering the University of Heidelberg, where he devoted more time to music than to law. He soon became known throughout Heidelberg as a skillful pianist and received invitations to play at Mannheim and Mainz. His compositions in 1829 include several short pieces, which afterward appeared among the *Papillons*, and in 1830 he composed his *Variations on the Name of Abegg*, which owed their origin to the lively impression made upon him by Meta Abegg. In the spring of 1830 Schumann went to Frankfort to hear Paganini. The impression the great violinist's playing made upon him is shown by his adaptation of several of the famous capriccios for the piano.

Schumann now determined to abandon law. In notifying his mother he referred her to Wieck for an opinion as to his abilities, and, on his mother's writing to Wieck, the latter's decision was in favor of Schumann. He was at last beginning to realize the disadvantage of having neglected theoretical studies. On his return to Leipzig, in 1830, he resumed his piano lessons with Friedrich Wieck. Dissatisfied with the progress he was making as a pianist, he devised a system of digital gymnastics, with the result that he injured the sinews of the third finger of his right hand so severely that he never fully regained its use. It was this forced abandonment of a pianist's career which led Schumann to arrange for instruction in composition from Heinrich Dorn, who took him as a pupil.

The year 1831 is important because during it Schumann first came before the public as a musical critic, contributing to the *Allgemeine Musik-Zeitung* an enthusiastic critique of Chopin's *Don Juan Fantasia*. In November, 1832, he was in Zwickau, where at a concert given by Klara Wieck, then 13 years old, a symphony by him in G minor was performed. The score of this work was lost and not found again until the summer of 1912. In 1833 he completed the Paganini transcriptions and wrote his piano impromptus on a theme by Klara Wieck, a composition which has romantic interest, as the young pianist, with whom his relations at that time were wholly artistic, later became his wife.

In 1834 Schumann and several other enthusiastic musicians and critics banded themselves under the name Davidsbündler to wage war against philistinism in music. They established

the *Neue Zeitschrift für Musik*. Schumann's contributions, when not over his own name, were signed Florestan Eusebius, Meister Raro, "2" and "12." One of his later critiques in which, under the title "Neue Bahnen," he hailed Brahms, who was then entirely unknown, as a musical Messiah, is a most notable example of musical prescience. Through the columns of his paper he also first proclaimed the genius of Chopin and accelerated the growing fame of Schubert and Mendelssohn, aided Franz and Gade, and practically introduced Berlioz to the musical world by his review of the *Symphonie phantastique*. In all matters relating to the achievements of other musicians he was most liberally appreciative, save in the case of Wagner.

Schumann's important musical work of 1834 was the *Etudes symphoniques*. The following year saw the production of two sonatas—the first, in F sharp minor, significantly dedicated "to Klara." Subsequently he went to Vienna in hopes of there placing the *Neue Zeitschrift* on a more remunerative basis, but was unsuccessful. It was during his Vienna sojourn, however, that he visited Schubert's brother Ferdinand and discovered Schubert's great *C major Symphony*. Friedrich Wieck had long opposed the marriage of his daughter to Schumann, but in September, 1840, they were at last united. The years of Schumann's uncertainty regarding the result of his ardent passion had been productive of some of his finest music. "Truly," he wrote to Dorn, "the contest for Klara has yielded much music." Several of the beautiful "Fantasiestücke," "Noveletten," "Nachtstücke," and the "Faschingsschwank aus Wien" for piano; his first symphony; and above all the songs, 138 in number, written in 1840 and including the famous "Liederkreis" and "Dichterliebe" of Heine and "Frauenliebe und Leben" of Chamisso are among the productions inspired by his love for Klara.

When Mendelssohn founded the Conservatory at Leipzig, Schumann, who was on terms of intimacy with him, became one of the instructors, but made little impression as a teacher. Among the important works composed before his removal to Dresden are the choral work *Das Paradies und die Peri* and the celebrated piano quintet. The Schumanns resided in Dresden from 1844 to 1850, when they settled in Düsseldorf. The principal works of the Dresden period are the piano concerto (op. 54), the *C major Symphony*, the opera *Genoveva* (unsuccessfully produced in Leipzig, 1850), the *Manfred* music, and the scenes from Goethe's *Faust*. Schumann's conductorship of the Chorgesang-Verein also was productive of much choral music.

Even while in Dresden he had suffered from attacks of melancholia, and these became frequent after he moved to Düsseldorf, whither he had been called as musical director. Here, nevertheless, he composed the *Rhenish Symphony* (inspired by the festivities incidental to the elevation of the Archbishop of Cologne to the rank of Cardinal) and the *D minor Symphony*. On Feb. 27, 1854, during a fit of melancholy, he attempted suicide by jumping into the Rhine. He was rescued and taken to a private asylum at Endenich, near Bonn, where he died, July 29, 1856.

Schumann's compositions are essentially expressions of moods. He was one of the most subjective, most "intimate" of composers, and for this reason most successful in the more compact forms such as the *Lied*, and in one-movement pieces like his "Noveletten" and "Fantasiestücke," or in works consisting of a series of smaller divisions like his "Kinderscenen" and "Faschingsschwank." While this is true in a general way, the piano concerto, piano quintet, his sonatas and symphonies rank among the best of their kind, though, as regards the symphonies, his orchestration is far from brilliant. In his compositions he was one of the founders, and in his writings the chief advocate, of the Neo-Romantic school, and nowhere have the tendencies of this school found more compact and eloquent expression than in his own works. His songs differ from those of his immediate forerunner, Schubert, in a closer interknitting of voice and accompaniment, in which respect Brahms is, par excellence, Schumann's successor. As a composer for the piano Schumann's importance cannot well be overestimated. Together with Chopin and Liszt he is the founder of a new piano technic, exploiting the utmost possibilities of the instrument. As for musical content and beauty his piano works rank with those of Chopin. A complete edition of his works in 34 volumes, edited by Klara Schumann (q.v.), was published by Breitkopf and Härtel. In 1893 Brahms edited a supplementary volume. Schumann's criticisms and writings on music were published in four volumes under the title *Gesammelte Schriften über Musik und Musiker* (Eng. trans. by F. Raymond-Ritter).

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SCHUMANN-HEINK, -hīnk, ERNESTINE, née ROESSLER (1861–). A dramatic contralto, born at Lieben, near Prague, Bohemia. She studied with Marietta von Leclair at Graz and made her début at Dresden in 1878, as Azucena in *Il Trovatore*. For four years she sang in Dresden and from 1883 in the Hamburg Stadtheater. After 1896 she appeared almost every summer at Bayreuth. She was married to a Mr. Heink in 1883, to Paul Schumann in 1893, and to William Rapp, Jr., in 1905. From the last named she gained a divorce in 1915. She made her American début in 1898 at the Metropolitan Opera House, where she immediately became a prime favorite, especially in the Wagnerian rôles. After 1908 she devoted herself almost exclusively to singing in concerts. In 1915–16 she appeared as a guest artist with the Chicago Opera. Madame Schumann-Heink took rank as the greatest contralto of her time, and her widely known fondness for domestic life gave her an added interest as an attractive anomaly.

SCHURÉ, shụ'rā', EDOUARD (1841–). A French historian of music and mystic poet. He was a stanch defender of Wagnerian music. He wrote: *Histoire du lied* (1868); *Le drame musical* (1875); *Les chants de la mort* (1877); *L'Ame de la patrie* (1892); *Les grandes légendes de la France* (1893); *La vie mystique* (1894), poems; *Sanctuaries d'orient* (1898); *Le double roman* (1899); *Souvenirs sur Richard Wagner* (1900); *Les grands initiés* (1901); *La prêtresse d'Isis* (1907).

SCHÜRER, shụ'rẽr, EMIL (1844–1910). A German Lutheran theologian. He was born in Augsburg, studied theology at Erlangen, Berlin, and Heidelberg, became professor of theology successively at Leipzig (1873), Giessen (1878), Kiel (1890), and Göttingen (1895). He has published *Die Gemeindeverfassung der Juden in Rom* (1879), *Die ältesten Christengemeinden im römischen Reich* (1894), and, the work by which he is best known, *Geschichte des jüdischen Volkes im Zeitalter Jesu Christi* (1886–90; 4th ed., 1909; Eng. trans., 1886–90). After 1876 with Adolf Harnack, he edited the *Theologische Litteraturzeitung*. He died at Göttingen, April 30, 1910.

SCHURMAN, shụr'mạn, JACOB GOULD (1854–). An American educator, born at Freetown, Prince Edward Island, Canada. He studied early at Acadia College, Nova Scotia, and in 1875 won the Gilchrist Canadian Scholarship at the University of London, where he graduated (A.B., 1877; A.M., 1878). Afterward he studied at the University of Edinburgh (Sc.D., 1878) and at Heidelberg, Berlin, and Göttingen and in Italy. From 1880 to 1882 he was professor of psychology, political economy, and English literature at Acadia College, from 1882 to 1886 was professor of metaphysics and English literature at Dalhousie College, and in the latter year became professor of philosophy at Cornell. In 1891 he was appointed dean of the Sage School of Philosophy at Cornell and in 1892 succeeded Charles Kendall Adams (q.v.) as president of the university. This office he retained, although at times absent on public service—in 1899 as president of the first Philippine Commission (*Report*, 4 vols., 1900) and in 1912–13 as Minister to Greece and Montenegro. A stanch and zealous Republican, he was chosen first vice president of the New York State Constitutional Convention in 1915. President Schurman became editor of the *Philosophical Review* in 1892. His publications include: *Kantian Ethics and the Ethics of Evolution* (1881); *The Ethical Import of Darwinism* (1888); *Belief in God* (1890); *Agnosticism and Religion* (1896); *Philippine Affairs: A Retrospect and an Outlook* (1902); *The Balkan Wars, 1912–13* (1914), Stafford Little Lectures at Princeton.

SCHURZ, shụrts, CARL (1829–1906). A German-American soldier, political leader, and journalist. He was born March 2, 1829, at Liblar, Prussia, and was educated at the Cologne Gymnasium and at the University of Bonn, where he became the associate of Gottfried Kinkel (q.v.) in the publication of a liberal newspaper. Because of his connection with the revolutionary movement of 1848–49 he was forced to retire to Switzerland. In 1850 Schurz returned secretly to Germany and with great skill succeeded in bringing about the memorable escape of Kinkel from the fortress of Spandau. After a residence in Paris, as correspondent for German papers, and in London, where he was a teacher, he emigrated to the United States in 1852, settling first in Philadelphia and afterward in Wisconsin, where he made Republican campaign speeches in German in 1856 and where he was an unsuccessful candidate for Lieutenant Governor in 1857. In 1859 he began to practice law in Milwaukee. He was a delegate to the National Republican Convention in 1860 and delivered both English and German speeches, of remarkable eloquence, during the canvass of that year. In 1861 he was appointed Minister to Spain by President Lincoln, but resigned on the outbreak of the Civil War and joined the army. As brigadier general he commanded a division at the second battle of Bull Run, and as major general he led the Eleventh Corps at Chancellorsville and participated in the battles of Gettysburg and Chattanooga. At the close of the war he made a tour of inspection through the Southern States as a special commissioner appointed by President Johnson to inquire into the condition of affairs in the seceded States. Later under Grant he opposed a radical programme for the South. He was Washington correspondent of the New York *Tribune* in 1865–66, founded the Detroit *Post* in 1866, and the next year became editor of the St. Louis *Westliche Post*, on which Joseph Pulitzer (q.v.) was for a time his associate.

From 1869 to 1875 Schurz served as United States Senator from Missouri. He opposed many of the measures of the Grant administration, took a leading part in the organization of the Liberal Republican movement, and in 1872 presided over the Cincinnati convention which nominated Greeley for President. He supported Hayes in 1876 and afterward served in his cabinet as Secretary of the Interior (1877–81). In 1881–83 he was editor in chief and one of the owners of the New York *Evening Post*. In the presidential campaign of 1884 he made vigorous speeches, favoring the election of Cleveland. During his term of office as Secretary of the Interior and after his retirement from public life he was an enthusiastic advocate of civil-service reform. As an upholder of "sound money" he opposed Bryan in 1896, but four years later supported him, disagreeing with the McKinley Philippine policy. In 1904 he supported Justice A. B. Parker (Democrat) for the presidency. He died in New York, May 14, 1906. Schurz wrote an excellent biography of Henry Clay (2 vols., 1887) in the *American Statesmen Series*, and one of Abraham Lincoln (1891), and was a member of the American Academy of Arts and Letters. In 1913 a monument to him was erected on Morningside Drive, New York. Consult the *Reminiscences of Carl Schurz* (3 vols., New York, 1907–08), a record to 1869 only, but with a sketch of Schurz's political career (1869–1906) by Frederic Bancroft and W. A. Dunning. Bancroft also selected and edited *Speeches, Correspondence, and Political Papers of Carl Schurz* (6 vols., New York, 1913).

SCHUSTER, shŭs'tẽr, ARTHUR (1851–). An English scientist, born at Frankfort-on-the-Main, son of a London and Frankfort banker and a brother of Sir Felix Schuster. He was educated at Frankfort, at Owens College, Manchester, and at the University of Heidelberg. In 1875 he led the English expedition to observe the solar eclipse in Siam and with J. Norman Lockyer got excellent photographs. From 1881

to 1907 he was professor of physics in the University of Manchester. He was president of Section A of the British Association in 1892, received the Royal medal of the Royal Society in 1893 and became secretary of the society, and was prominent in international associations on seismology and for solar research. He did particularly important experimental work in spectroscopy (largely with G. A. Hemsalech) and in calorimetry, radiometry, and terrestrial magnetism. He wrote *A Theory of Optics* (1904).

SCHUSTER, Sir Felix (1854–). A British banker and publicist. He was educated in Germany and Switzerland and at Owens College, Manchester, and served as director after 1888 and also as governor after 1895 of the Union of London and Smiths Bank, Ltd. Schuster was a member of the Royal Commission on London Traffic (1903–05), of a Board of Trade commission (1905), of an India Office committee (1907–08), of the Treasury Committee on Irish Land Purchase Finance (1907–08), and of the Council of India after 1906. In 1905–06 he was chairman of the Council of the London Chamber of Commerce, and, in 1908–09, president and chairman of the Council of the Institute of Bankers. In 1906 he was created Baronet. He published *The Bank of England and the State* (1906). For his brother see Schuster, Arthur.

SCHÜTT, shut. Two islands in the Danube, situated in the Hungarian plain between Pressburg and Komorn and mostly in these two counties.—Great Schütt Island is bordered by the Danube proper on the south and west and by the Little Danube and the Schwarzwasser (Oeregduna) (Map: Hungary, E 3). It is 58 miles long, from 10 to 20 miles wide, and is subject to the floods of the rivers, being low and even. Owing to its rich soil, it is called the Golden Garden of Hungary. Grain, fruits, and vegetables are raised. There are sugar factories. It has several towns, including Komorn, which is situated in the southeast corner of the island. Pop., 1910, 25,107.—Little Schütt Island, bordered by the Danube proper on the north and east and by the Wieselburger Danube and lying to the southwest of Great Schütt Island, is 28 miles long. It belongs to the countries of Raab and Wieselburg.

SCHÜTZ, shuts, Heinrich, known by the Latinized form of his name as Sagittarius (1585–1672). The most important German composer of the seventeenth century, born at Köstritz, near Gera, Saxony. At the age of 14 he became a chorister of the Court Chapel at Cassel. He went to Italy, where he studied under Giovanni Gabrieli until the death of that master in 1612. In 1617 he was appointed kapellmeister to the Elector of Saxony in Dresden. He was a prolific composer and writer and has been well described as "standing at the parting of the ways between Palestrina and Bach." In his writing he combined the impressive Italian choral style with the new dramatic monodic style of Monteverde. He was the composer of the first German opera, *Dafne* (1627). Consult A. Pirro, *Schütz* (Paris, 1913).

SCHÜTZENBERGER, shuts'ĕn-bĕr'gĕr, Paul (1829–97). A French chemist. He was born at Strassburg and studied medicine at the university there. For several years he taught chemistry at Mülhausen and in 1865 became assistant to Balard in Paris. In 1876 he was made professor at the Collège de France and in 1882 accepted a chair also at the Ecole Municipale de Chimie et de Physique. Schützenberger will be remembered for his valuable contributions to the chemistry of the alkaloids as well as to physiological and industrial chemistry. His works, *Les fermentations* (1875) and *Traité de chimie générale* (7 vols., 1880–94), are well known. His investigations on atomic weights led him to believe that these characteristic combining quantities of the elements are not absolutely constant, as generally held, but distinctly variable even in one and the same compound. While the probability of this opinion being correct is very slight, it is nevertheless interesting in connection with T. W. Richards's (q.v.) demonstration that the atomic weight of lead depends on the source from which the lead compound experimented upon is derived.

SCHUYLER, skī'lĕr, Eugene (1840–90). An American diplomat and historian. He was born in Ithaca, N. Y. After graduation at Yale (1859) he practiced law in New York, but from 1866 to his death, almost without a break, he was engaged in consular and diplomatic service—at Moscow, Reval, St. Petersburg, Constantinople, Birmingham, Rome, Bucharest, in Greece (Minister and Consul General), and at Cairo. Travels in 1873 in Russian Turkestan, Khokan, and Bokhara provided him with material for a book entitled *Turkestan* (1876). He wrote also *Peter the Great, Emperor of Russia* (1884) and *American Diplomacy and the Furtherance of Commerce* (1886). His chief essays were posthumously collected in *Italian Influences*, an accompanying volume, *Selected Essays*, containing a memoir by Evelyn Schuyler Schaeffer (1901). In addition Schuyler translated Turgenev's *Fathers and Sons* (1867) and Tolstoy's *The Cossacks* (1878).

SCHUYLER, Louisa Lee (c.1838–). An American leader in charitable work, the great-granddaughter of Gen. Philip Schuyler and of Alexander Hamilton. During the Civil War she joined the United States Sanitary Commission as one of its volunteer workers in New York City. In 1873 she helped to organize the New York State Charities Aid Association and in the following year established the first training school for nurses in the United States, in connection with Bellevue Hospital. In 1907 she was appointed one of the original trustees of the Russell Sage Foundation. In recognition of her 40 years of activity in charitable work she received in 1915 the first honorary degree of LL.D. ever conferred upon a woman by Columbia University.

SCHUYLER, Montgomery (1843–1914). An American editorial writer and author, born in Ithaca, N. Y. He studied at Hobart College, but did not graduate. In 1865 he joined the staff of the New York *World*, remaining with that paper in various capacities until 1883, after which he was an editorial writer on the New York *Times* until 1907 and on the New York *Sun* from 1912 till his death. He made a special study of architecture, upon which subject he was a frequent contributor to magazines. He published *The Brooklyn Bridge* (1883), with William C. Conant; *Studies in American Architecture* (1892); *Westward the Course of Empire* (1906); *The Woolworth Building* (1913). Schuyler was a member of the National Institute of Arts and Letters.

SCHUYLER, Philip John (1733–1804). An eminent American soldier and statesman, born Nov. 20, 1733, at Albany, N. Y. Entering the English army on the outbreak of the French and Indian War, he served as captain in 1755 and as captain and commissary in 1756. In 1757 he resigned, but reëntered the army, as major, in 1758 and served as such until the close of the war. He was elected to the Colonial Assembly in 1768 and in May, 1775, was a delegate to the Continental Congress, by which he was made a major general on June 19. Being assigned by Washington to the command of the Northern Department, he organized the expedition against Canada, which was to proceed by way of Lake Champlain, but he was forced by illness to depute the active leadership of the invading troops to Gen. Richard Montgomery (q.v.). Returning to Albany, he directed operations against the Indians and Tories and, as Indian Commissioner, carried on important negotiations with the Six Nations. Meanwhile Gen. Horatio Gates (q.v.) and many of the New England delegates, who had been offended by Schuyler's attitude in the New York-Massachusetts boundary disputes, began scheming for his removal; and in September, 1776, disgusted at these intrigues, he sent in his resignation, which, however, was not accepted by Congress. In April, 1777, a congressional court of inquiry strongly commended him for his conduct hitherto, but the attacks continued, being especially bitter after St. Clair's evacuation of Ticonderoga, and on August 19 General Gates was appointed to supersede him in command of the Northern Department. Schuyler, however, remained with the army and assisted very materially in the operations against Burgoyne. A court martial, convened in October, 1778, acquitted him with the highest honor of all charges, and his resignation having been accepted April 19, 1779, he became one of New York's representatives in Congress, serving until 1781. After the war he was one of the leaders of the Federalist party and held many important State offices, besides representing New York in the United States Senate in 1789–91 and again in 1797–98. While serving in the State Senate he helped codify the New York laws and ardently advocated the building of State canals. Throughout his public career he was conspicuous for his great abilities, his stanch patriotism, and his unselfish devotion to duty. His daughter Elizabeth married Alexander Hamilton. Consult B. J. Lossing, *Life and Times of Major General Philip Schuyler* (2 vols., New York, 1872–73), and Bayard Tuckerman, *Life of General Philip Schuyler* (ib., 1904).

SCHUYLKILL HAVEN. A borough in Schuylkill Co., Pa., 4 miles south of Pottsville, on the Schuylkill River, and on the Pennsylvania, the Philadelphia and Reading, and the Lehigh Valley railroads (Map: Pennsylvania, J 6). It has large car shops, underwear and shoe factories, rolling mills, and pipe mills. Pop., 1900, 3654; 1910, 4747.

SCHUYLKILL (skōōl'kĭl) **RIVER.** A river of Pennsylvania, rising in the highlands of Schuylkill County and flowing southeast about 100 miles to the Delaware, which it joins at Philadelphia (Map: Pennsylvania, K 7). It has been improved for slack-water navigation nearly to its source; it furnishes part of Philadelphia's water supply and affords extensive wharfage in its course through the city.

SCHWAB, shwäb, Charles M. (1862–). An American capitalist, born at Williamsburg, Pa. He entered the employment of the Carnegie Company as a stake driver in the engineering corps of the Edgar Thompson Steel Works, of which he was chief engineer and assistant manager in 1881–87 and general superintendent in 1889–97. Meanwhile he was also superintendent in 1887–89 and general superintendent in 1892–97 of the Homestead Steel Works. Schwab was largely responsible for the "trustification" of the steel industry and was president from 1897 to 1901 of the Carnegie Steel Company, Ltd., the largest of the steel mergers in the late nineties. He persuaded Carnegie to accept J. P. Morgan's plans for the great steel trust and in 1901–03 was president of the resulting United States Steel Corporation. At the end of this period Schwab became president of the Bethlehem Steel Corporation, generally considered the most important competitor of the trust. During the first year, at least, of the European War this company had a virtual monopoly in contracts to supply the allies with certain kinds of munitions, and the stock of the corporation experienced a phenomenal rise of more than 500 points in value per share. In November, 1915, a part of the Bethlehem plant was destroyed by fire, generally believed incendiary in origin, with a loss of $4,000,000.

SCHWAB, shväp, Gustav (1792–1850). A German poet, scholar, and pastor, born at Stuttgart. He studied at Tübingen, taught at Stuttgart, became pastor at Gomaringen (1837) and in Stuttgart (1841). In poetry he was a pupil of Uhland, but lacked his classic simplicity and sense of form. Several of his ballads are deservedly popular for their purity and warmth of feeling. His *Gedichte* (1828–29) were revised and pruned as *Neue Auswahl* (1838) and are still reprinted. Schwab wrote in prose a *Life of Schiller* (1840), *Die schönsten Sagen des klassischen Altertums* (1838–40; often reëdited), *Deutsche Volksbücher* (1843; often reprinted), and a *Wegweiser durch die Litteratur der Deutschen* (1846). Consult Klüpfel, *Gustav Schwab als Dichter und Schriftsteller* (Stuttgart, 1884).

SCHWABACH, shvä'bäg. A town of the Province of Middle Franconia, Bavaria, 9 miles south of Nuremberg (Map: Germany, D 4). The Gothic church of St. John, dating from 1469, contains a magnificent altarpiece by Veit Stoss and fine old paintings. The Gothic ciborium, 41 feet high, is the work of A. Krafft. The market place contains a beautiful fountain, built in 1617. Gold and silver wire is manufactured. The famous Schwabach needles are made here. The Schwabach Articles (1529) were the basis for the Augsburg Confession (1530). Pop., 1900, 9385; 1910, 11,200.

SCHWABE, shvä'be, Ludwig von (1835–1908). A German classical scholar, born at Giessen. He became professor in the University of Tübingen. His important publications are: *Quæstiones Catullianæ* (1862); *Catullus* (1866, 1886); *De Musæo Nonni Imitatore* (1876). He was also editor of the fifth edition of Teuffel's *Geschichte der römischen Litteratur* (1890), which was translated into English by G. C. W. Warr (2 vols., London, 1891–92).

SCHWABE, Samuel Heinrich (1789–1875). A German astronomer, born at Dessau. He studied at Berlin in 1809–11 and later succeeded to his grandfather's apothecary business. In

1826 he began his observations of the sun spots and after 1830 devoted his time exclusively to astronomy. Schwabe is remembered as the discoverer of the periodicity of the sun spots, having first suggested in 1843 that the number of sun spots reached their maximum at every tenth year. His observations were used by Humboldt in his *Kosmos*.

SCHWABEN, shvä'ben. See SWABIA.

SCHWABENSPIEGEL, shvä'ben-shpē'gel (Swabian Mirror). A mediæval German law book, compiled probably by an ecclesiastic of the cathedral chapter at Bamberg about 1259. Its main source was the Sachsenspiegel (q.v.), and it attained legal authority chiefly in Swabia, Alsace, Franconia, Switzerland, and Austria. It was written in Upper German and printed at an early period, probably at Augsburg; the first dated edition is of 1480. A thorough critical edition, by Rockinger, appeared as one of the publications in the historical class of the Royal Bavarian Academy (Munich, 1906).

SCHWÄBISCH HALL, shvā'bĭsh häl. A town of Germany. See HALL.

SCHWALBACH, shväl'bäg (officially called LANGEN-SCHWALBACH). A mineral spa, 13 miles by rail northwest of Wiesbaden, in Hesse-Nassau, Germany (Map: Germany, C 3). It was a fashionable watering place in the seventeenth and eighteenth centuries. The waters contain iron and carbonic acid, and its mud baths are esteemed. Pop., 1900, 2677; 1910, 3058.

SCHWALBE, shväl'be, BENEDIKT. A German Benedictine monk. See CHELIDONIUS.

SCHWALBE, GUSTAV (1844–). A German anatomist and anthropologist, born in Quedlinburg and educated at the universities of Zurich, Bonn, and Berlin. He studied medicine and in 1868 became an assistant under Willy Kühne in the Amsterdam Institute of Physiology. In 1867 he had discovered, with Loven, the terminal taste organs or bulbs. Schwalbe served in the campaigns of 1866 and 1870–71 and afterward became professor of anatomy at Leipzig in 1871, at Jena in 1873, at Königsberg in 1881, and at Strassburg in 1883. His principal work was divided between anatomy and neurology on one side and prehistoric craniology on the other. He wrote: *Lehrbuch der Neurologie* (1881); *Lehrbuch der Anatomie den Sinnesorganen* (1887); *Pithecanthropus erectus* (1899); *Der Neandertalschädel* (1901); *Die Vorgeschichte des Menschen* (1904).

SCHWALLY, shväl'lē, FRIEDRICH (1863–). A German Orientalist, born in Butzbach, Upper Hesse, and educated at the universities of Giessen and Strassburg. He was professor of Oriental languages first at Strassburg and then at Giessen. He published: *Das Leben nach dem Tode* (1892); *Idiotikon des christlich-palästinischen Aramäisch* (1893); *Die Kultur des alten Orients* (1896); *Die Kultur des Islam im Mittel Alter* (1897); *Semitische Kriegsaltertümer* (1901); *The Book of Kings* (1904), with Stade, for Haupt's Polychrome Bible; and a second edition of Nöldeke's *Geschichte des Qōrans* (1908 et seq.).

SCHWANN, shvän, THEODOR (1810–82). A German physiologist and histologist, born at Neuss and educated in Bonn, Würzburg, and Berlin (M.D., 1834). In the Anatomical Museum of Berlin he assisted Johannes Müller from 1834 to 1838 and discovered pepsin, made valuable studies on artificial digestion, fermentation, and putrefaction, the organic nature of yeast, the mechanism of muscular and arterial contraction, the double direction of nerves, and the envelope of the axis cylinder of nerves. In 1838–48 he was professor of anatomy at Louvain, and at Liége held the chair of anatomy for a decade and then that of physiology. Schwann made many physiological discoveries, but his most important achievement was his foundation of the modern cellular theory in *Mikrokopische Untersuchungen über die Uebereinstimmung in der Structur und dem Wachsthum der Thiere und Pflanzen* (1839; Eng. version by Henry Smith, *Microscopical Researches into the Accordance in the Structure and Growth of Animals and Plants*, 1847). He wrote "Anatomie du corps humain," which was printed in the Brussels *Encyclopédie populaire* in 1855.

SCHWANTHALER, shvän'tä'lĕr, LUDWIG VON (1802–48). A German sculptor. He was born at Munich and studied under his father, Franz Schwanthaler (1762–1820), and at the Munich Academy. His first royal commission was received in 1824 from King Maximilian I, an order for a silver épergne with reliefs from the myth of Prometheus. In 1826 King Louis I sent him to Rome. Upon his return to Munich the next year, he was commissioned to execute reliefs and decorative features for the New Glyptothek. To this period, also, belong the statue of Shakespeare in the vestibule of the Royal Theatre and the Bacchus frieze (205 feet long) in Duke Max's banqueting hall. In 1832 he went again to Rome, where he executed several groups for the southern pediment of the Walhalla at Regensburg and models for his 24 statues of painters in the New Pinakothek. In 1835 he was appointed professor at the Munich Academy. For Louis I he executed Homeric reliefs in the Königsbau and 12 colossal statues of Wittelsbach princes; also the pediments of the Walhalla at Regensburg and of the Propylæum at Munich and the bronze statue of Bavaria (1844–50), nearly 63 feet high, in front of the Ruhmeshalle at Munich. Mention must be made also of his monuments to Jean Paul Richter (1841) at Bayreuth, to Mozart (1842) at Salzburg, and to Goethe (1843) at Frankfort; of his statues of the Grand Duke Charles Frederick of Baden (1840, Karlsruhe), the Grand Duke Louis of Hesse (Darmstadt), the Margrave Frederick Alexander of Brandenburg (1843, Erlangen), and the Emperor Rudolph of Hapsburg (1843, Speyer Cathedral); and of the charming relief of two dancers, besides other figures in the palace at Wiesbaden. Schwanthaler's fine collection of plastic studies, bequeathed to the state, is assembled in a museum bearing his name in Munich. He is the chief representative of the romantic as distinguished from the prevailing classic and later realistic sculpture in Germany. Consult Trautmann, *Schwanthalers Reliquien* (Munich, 1858).

SCHWARTZ, JOZUA MARIUS WILLEM. See MAARTENS, MAARTEN.

SCHWARTZ, shwärts, MARIA SOFIA (1819–94). A Swedish novelist, born at Borås. Her writings were popular, not only in Sweden, but in Germany. Her novels, frequently collected in German versions and many of them translated into other languages, include notably: *Mannen af Börd och Quinnan af Folket* (1858); *Arbetet Adlar Mannen* (1859); *Arbetets Barn* (1864;

reprinted in America, 1894). Her *Valda Romaner* appeared in seven volumes (1891–94).

SCHWARTZ, shvärts, MARIE ESPÉRANCE VON (known also as Elpis Melena) (1821–99). A German author, daughter of a Hamburg banker named Brandt. She was born at Southgate, England. After a first early marriage she became the wife of Herr von Schwartz, a Hamburg banker, from whom eventually she was separated. She then settled in Rome and devoted herself to literary work. A friendship with Garibaldi, one of whose works she translated into German, was one of the interesting features of her residence in Italy. Among her numerous works may be named: *Blätter aus den afrikanischen Reisetagebuche einer Dame* (1849); *Die Insel Kreta unter der ottomanischen Verwaltung* (1867); *Kreta-Biene, oder kretische Volkslieder, Sagen, Liebes-, Denk-, und Sittensprüche* (1874); *Garibaldi, Mitteilungen aus seinem Leben* (2 vols., 1884).

SCHWARTZ, STEFAN (1851–). An Austro-Hungarian medalist and sculptor. He was born at Neutra, Hungary, studied at Budapest under Landauer, and then went to Vienna, where he learned chasing under Dziedzinski and Hanush and sculpture under Otto König. In 1876 he was director of a school of chasing and engraving and after 1884 was professor at the Royal Industrial Art School, Vienna, where he strongly influenced the development of the medallic art. His work is distinguished by careful technique, grace, and inventive power. Characteristic examples, displayed at the International Medallic Exhibition, New York (1910), include commemorative medals of the "Death of Empress Elizabeth," the "Schiller Festival," and the "Bucharest Exposition" and portrait medals of Raphael Donner, Emperor Francis Joseph, and King Peter of Servia. Among his large monumental works are the tombs of Rudolf Eitelberger (Central Cemetery, Vienna) and of Cardinal Fürstenberg (Olmutz Cathedral) and the statues of Adventus Augusti (Hofburg, Vienna) and of Seneca and Count Schönborn (both in the Houses of Parliament, Vienna). He also executed many charming plaques, dishes, goblets, etc., in precious metal and bronze.

SCHWARTZ, WILHELM (1821–99). A German mythologist. He was born in Berlin, studied there and in Leipzig, and was teacher and director in several important Gymnasiums till 1894. He wrote: *Märkische Sagen und Märchen* (1843) and *Norddeutsche Sagen* (1849), both results of early studies and travels with Adalbert Kuhn; *Ursprung der Mythologie* (1860); *Die poetischen Naturanschauungen der Griechen, Römer und Deutschen in ihrer Beziehung zur Mythologie* (1864–79); *Prähistorisch-anthropologische Studien* (1884); *Nachklänge prähistorischen Volksglaubens im Homer* (1894).

SCHWARTZE, shvär'tse, HERMANN (1837–1910). A German aurist, born at Neuhof in Pomerania and educated in Berlin and Würzburg. He settled in Halle, where he became assistant professor of otology at the University. One of the founders of modern otology, Schwartze made a particular study of the anatomy of the ear and improved the methods of paracentesis on the tympanic membrane and of the opening of inflamed apophyses of the middle ear. He wrote *Praktische Beiträge zur Ohrenheilkunde* (1864), *Pathologische Anatomie des Ohrs* (1878; Eng. trans. by J. O. Green, *The Pathological Anatomy of the Ear,* 1878), *Lehrbuch der chirurgischen Krankheiten des Ohrs* (1885), and *Grundriss der Otologie* (1905); was coëditor with Berthold of the *Handbuch der Ohrenheilkunde* (1892–93); and in 1872 became editor of the *Archiv für Ohrenheilkunde.*

SCHWARZ, shvärts, HERMANN (1864–). German philosopher, born at Düren, Rhenish Prussia. Educated at Halle, where he devoted himself to mathematics and to philosophy, he became professor at Marburg in 1908 and at Greifswald in 1910. His philosophy is a critical realism not unlike that of Uphues. He edited the *Zeitschrift für Philosophie und philosophische Kritik.* He wrote: *Das Wahrnehmungsproblem* (1892); *Was will der kritische Realismus?* (1894); *Grundzüge der Ethik* (1896); *Psychologie des Willens zur Grundlegung der Ethik* (1900); *Das Sittliche Leben* (1901); *Glück und Sittlichkeit* (1902); *Der moderne Materialismus* (1904; 2d ed., 1912); *Der Gottesgedanke in der Geschichte der Philosophie* (1913).

SCHWARZ, HERMANN AMANDUS (1843–). A German mathematician, born at Hermsdorf in Silesia and educated in Berlin. He became assistant professor at Halle in 1867, professor of mathematics at the Zurich Polytechnic in 1869, at the University of Göttingen in 1875, and at Berlin in 1892, where he became a member of the Royal Academy. Schwarz was a follower of Weierstrass, some of whose lectures he edited under the title *Formeln und Lehrsätze zum Gebrauche der elliptischen Funktionen* (1883–85; 2d ed., 1893). His own works on minimal surfaces and the theory of functions include *Bestimmung einer speziellen Minimalfläche,* which was crowned by the Berlin Academy in 1867 and printed in 1871, and *Gesammelte mathematische Abhandlungen* (1890).

SCHWARZ, KARL (1812–85). A German Protestant theologian, born at Wiek, Isle of Rügen. He studied at Halle, Bonn, and Berlin, was imprisoned six months in 1837 for his political views, and then became a collaborator on the *Hallische Jahrbücher.* After lecturing two years at Halle he was suspended by the government in 1845, but in 1849 was appointed professor there. In 1858 Schwarz became chief court preacher. He is author of *Das Wesen Religion* (1847); *Lessing als Theolog* (1854); *Zur Geschichte der neuern Theologie* (1856; 4th ed., 1869); *Predigten aus der Gegenwart* (8 vols., 1859–83); *Grundriss der christlichen Lehre* (1873; 5th ed., 1876).

SCHWARZBURG-RUDOLSTADT, shvärts'-bŭrk-rōō'dōl-shtät. A principality and constituent state of the German Empire, situated in Thuringia and consisting of several detached portions (Map: Germany, D 3). The capital, Rudolstadt, is 18 miles south of Weimar. Total area, 363 square miles. The western and larger part belongs to the region of the Thuringian Forest and reaches an elevation of 2900 feet. The eastern part is lower. The chief river is the Saale. Agriculture is the principal occupation. There are extensive forests in the western part and good pasture land. The chief mineral deposits are iron, lignite, gypsum, and slate. In the western district are numerous glass and porcelain factories. Other manufactures are paper, toys, textiles, musical instruments, and flour. The Diet of the principality consists of 16 members, of whom four are elected by the highest taxed citizens and the rest by the gen-

eral population for three years. The principality has one vote in the Bundesrat and returns one member to the Reichstag. Pop., 1900, 93,059; 1910, 100,702, chiefly Protestants.

The ruling family is one of the oldest of the Thuringian princely houses. The mediæval Countship of Schwarzburg was divided at the close of the sixteenth century into the two countships of Schwarzburg-Rudolstadt and Schwarzburg-Arnstadt, the later Schwarzburg-Sondershausen. About a century later the ruling houses were elevated to the princely dignity.

SCHWARZBURG-SONDERSHAUSEN, -zŏn'dĕrs-hou'zen. A principality and constituent state of the German Empire, situated in Thuringia and consisting of several detached districts, the main portion being inclosed within the Prussian Province of Saxony (Map: Germany, D 3). Total area, 333 square miles. The Thuringian Forest covers part of the principality. The soil is mostly fertile, and agriculture is the principal industry. The forests are also important. There are numerous small porcelain factories, glassworks, machine works, paint factories, tanneries, shoe factories, and sugar mills. The constitution of the principality, dating from 1857, provides for a Diet of 18 members, of whom six are appointed by the Prince, six are elected by the highest taxed citizens, and six by the inhabitants in general for a term of four years. The principality has one vote in the Bundesrat and returns one deputy to the Reichstag. Pop., 1900, 80,898; 1910, 89,984, principally Protestants. The capital is Sondershausen (q.v.); the largest town is Arnstadt. For history, see SCHWARZBURG-RUDOLSTADT, with which it became united under the same ruling Prince in 1909.

SCHWARZENBERG, shvärts'en-bĕrk. A princely family, originally of Franconia, but later of Austria. About 1420 ERKINGER VON SEINSHEIM purchased the Lordship of Schwarzenberg in Franconia, and in 1429 he was made Baron of the Empire by the Emperor Sigismund. Several of this family have been prominent in European affairs. The most notable are: 1. ADAM, Count of Schwarzenberg, was born in 1584 and became Privy Councilor of George William, Elector of Brandenburg. He was largely responsible for the vacillating policy of Brandenburg during the Thirty Years' War, a course most unfortunate in its results, and for this he was punished after the accession of the Great Elector, in 1640, by imprisonment in the fortress of Spandau, where he died March 14, 1641. 2. KARL PHILIPP, Prince of Schwarzenberg. He was born at Vienna, April 15, 1771, served against the Turks, and rose to the grade of lieutenant field-marshal in 1790. He commanded a division under Mack in the campaign of 1805 and took part in the battle of Austerlitz. He was appointed Ambassador at the Russian court in 1808 by the express wish of the Emperor Alexander, fought at Wagram in 1809, and after the Treaty of Schönbrunn conducted the negotiations preliminary to the marriage of the Archduchess Maria Louisa to Napoleon. Both in this capacity and as Ambassador at Paris he gained the esteem of Napoleon, and the latter expressly demanded for him the post of general in chief of the Austrian contingent of 30,000 men which had been sent to aid France against Russia in 1812. Schwarzenberg with his little army entered Russia from Galicia, crossed the Bug, and achieved some slight successes, but was afterward driven into the Grand Duchy of Warsaw and took up a position at Paltusk, where he concluded with the Russians an armistice which secured the French retreat. Schwarzenberg was much blamed for his dilatory conduct at the time, but Napoleon concealed any dissatisfaction he might have felt and demanded for him from the Austrian government the baton of field-marshal. After a brief sojourn at Paris, in April, 1813, Schwarzenberg was appointed to the command of the Austrian army of observation in Bohemia; and when Austria joined the allied Powers, he became generalissimo of the armies of the coalition, was defeated by Napoleon at Dresden, but the united army under him gained the great victory of Leipzig. On the return of Napoleon from Elba he obtained the command of the allied army on the upper Rhine and a second time entered France. On his return to Vienna he was made president of the Imperial Council for War. He died of apoplexy at Leipzig, Oct. 15, 1820. Consult Prokesch-Osten, *Denkwürdigkeiten aus dem Leben des Feldmarschalls Fürsten Schwarzenberg* (Vienna, 1822). 3. His nephew, FELIX, an Austrian statesman, was born Oct. 2, 1800, at Krumau, Bohemia. He entered the army, became military attaché of the Austrian Embassy at St. Petersburg in 1824, and afterward held several diplomatic appointments. He took the field in Upper Italy as a brigade commander and soon after was made a lieutenant field-marshal. He was called to the head of the government in Vienna in November, 1848, opposed the German nationalist plans advocated at Frankfort, obtained the aid of Russia to suppress the Hungarian rising, and followed the policy of Metternich in opposing Prussia. He died in Vienna, April 5, 1852. Consult Berger, *Leben des Fürsten Felix zu Schwarzenberg* (new ed., Vienna, 1881).

SCHWARZWALD, shvärts'vält. The German name of the Black Forest (q.v.).

SCHWATKA, shwŏt'kà, FREDERICK (1849–92). An American explorer, born at Galena, Ill. He graduated at West Point in 1871 and served in the army until 1885, resigning as first lieutenant. During this period he studied both law and medicine, was admitted to the Nebraska bar in 1875, and received his medical degree in New York in 1876. In 1878 he obtained leave of absence and conducted, with W. H. Gilder, the final search for the records of the Franklin expedition. Wintering (1878–79) among the Eskimo near Chesterfield Inlet, Hudson Bay, he set out in April, 1879, with 4 whites and 14 Eskimo for King William Land. He explored minutely the continental coast line to Point Seaforth, crossed Simpson Strait to King William Land, and thoroughly searched the region traversed by Franklin's retreating party. During three months on King William Land Schwatka found four despoiled graves, six unburied skeletons, and many relics of the ill-fated expedition, but failed to discover any records. The journey was one of the most remarkable in the history of Arctic sledging. In the 355 days that he was absent from his base he traveled 2819 geographical miles, depending for food upon game. In 1883 he explored the upper Yukon River, Alaska. In 1886 he made an unsuccessful attempt to ascend Mount St. Elias. Schwatka received the Roquette Arctic medal from the Geographical Society of Paris and the medal of the Imperial Geographical Society of Russia. His Arctic jour-

ney was described by his comrade, W. H. Gilder, in *Schwatka's Search* (New York, 1881), also in *The Franklin Search, under Lieutenant Schwatka* (1881). His own writings comprise: *Along Alaska's Great River* (1885); *Nimrod in the North* (1885); *Children of the Cold* (1886).

SCHWEGLER, shvā'glĕr, Albert (1819–57). A German theologian and writer on the history of philosophy. He was born at Michelbach in Württemberg, studied theology at the University of Tübingen, and was appointed professor of classical philology there in 1848. In theology and criticism he was of the Tübingen school. In 1844 he started the *Jahrbücher der Gegenwart.* He published: *Der Montanismus und die christliche Kirche des zweiten Jahrhunderts* (1841); an annotated edition and translation of Aristotle's *Metaphysics* (1844–48); *Das nachapostolische Zeitalter* (1846); *Geschichte der Philosophie* (1848; Eng. trans. by J. H. Seelye, New York, 1856, and by J. H. Stirling, London, 2d ed., 1868); *Römische Geschichte* (1853–58; 2d ed., 1867–73). His *Geschichte der griechischen Philosophie* was published after his death (1859).

SCHWEIDNITZ, shvīt'nĭts. A town in the Province of Silesia, Prussia, on the Weistritz, 31 miles southwest of Breslau (Map: Germany, G 3). Its ancient fortifications have been replaced by promenades. The manufactures include woolens, leather, machinery, furniture, gloves, cigars, and organs. There are important cattle and grain markets. Its Schöpsbier and other local beers are famous. It was until 1741 the capital of the Principality of Schweidnitz. Pop., 1900, 28,432; 1910, 31,308.

SCHWEIGER-LERCHENFELD, shvī'gĕr-lĕr'ken-fĕlt, Amand, Baron von (1846–1910). An Austrian traveler, born in Vienna. He served in the army from 1865 to 1871, then set out on extensive travels, which he described in numerous popular works, and made Vienna his usual residence. A partial list of his writings includes: *Unter dem Halbmond* (1876); *Bosnien* (2d ed., 1879); *Serail und Hohe Pforte* (anon., 1879); *Das Frauenleben der Erde* (1881); *Der Orient* (1882); *Griechenland in Wort und Bild* (1882); *Das eiserne Jahrhundert* (1883); *Von Ozean zu Ozean* (1884); *Die Araber der Gegenwart* (1885); *Das Mittelmeer* (1888); *Die Erde in Karten und Bildern* (1889); *Unterwegs* (1891–95), traveling pictures; *Die Donau* (1895); *Im Lande der Cyclopen* (1899); *Das neue Buch von der Weltpost* (1901); *Die Frauen des Orients* (1903); *Kulturgeschichte: Werden und Vergehen im Völkerleben* (2 vols., 1906); *Unsere fünf Sinne* (1909).

SCHWEIGGER, shvī'gĕr, Johann Salomo Christoph (1779–1857). A German physicist, born and educated in Erlangen. After teaching at Bayreuth (1803–11) and at the Nuremberg Polytechnic he returned to Erlangen as professor of physics and chemistry in 1817. Two years later he went to Halle. Schweigger devised an electrometer in 1808 and in 1820 invented the galvanometer (q.v.), in which he made use of Oersted's discovery of the effect of a current in a magnetic needle by surrounding the latter with a number of turns of the wire carrying the current. He founded the *Journal für Chemie und Physik.*

SCHWEIGHÄUSER, shvīk'hoi'zer, Johann (1742–1830). A German philosopher and classical scholar, born at Strassburg. From 1770 to 1789 he taught philosophy at Strassburg. During the French Revolution he was banished, but from 1794 to 1824 he was again in Strassburg, where he held the chair of Greek after 1809. He edited Appian (1785), Polybius (1789–95), Epictetus and Cebes (1798), Athenæus, in 14 volumes, giving Casaubon's commentary in full, besides notes of his own (1798), parts of Seneca's prose works (1808), and Herodotus (1810). He compiled also valuable lexicons to Polybius (1795) and Herodotus (1824) and gathered his minor writings together in his *Opuscula Academica* (1806). Consult J. E. Sandys, *A History of Classical Scholarship,* vol. ii (Cambridge, 1908).

SCHWEINFURT, shvīn'fŭrt. A town in Lower Franconia, Bavaria, on the Main, 28 miles by rail northeast of Würzburg (Map: Germany, D 3). The sixteenth-century town hall contains a library and a museum of history and art. Schweinfurt is noted for its manufactures of steel balls and dyes, including the well-known Schweinfurt green. Machinery, shoes, sugar, and tobacco are among its numerous products. There are important cattle, sheep, and swine markets held fortnightly. Schweinfurt, first mentioned in 791, became a free Imperial city in the twelfth century. It passed to Bavaria in 1803. Pop., 1900, 15,295; 1910, 23,401.

SCHWEINFURTER (shvīn'fŭr'tĕr) **GREEN.** See Paris Green.

SCHWEINFURTH, shvīn'fŭrt, Georg August (1836–). A German explorer, born at Riga. He studied natural history, particularly botany, at the universities of Heidelberg, Munich, and Berlin and in 1863 went to Egypt, where he spent three years. In 1868 he again went to Egypt and in 1869 set out from Khartum to explore the countries along the White Nile. In 1875, on a commission from the Khedive, he founded the Institut Egyptien at Cairo, and in 1874 he visited the principal oases in the Libyan Desert. During the following years he several times visited the oases of Arabia, of whose flora he made a thorough study, and explored the coast of Barca and the valley of the Nile. In 1889 he took up his residence in Berlin. In 1901–02 he visited Egypt again, returning with rich archæological and botanical collections. Among his publications are: *In Herzen von Afrika* (1874; Eng. trans., *The Heart of Africa,* 1874); *Artes Africanæ* (1875); *Sammlung arabisch äthiopischer Pflanzen* (1894); *Aufnahmen in der östlichen Wüste von Ægypten* (1900–02); *Wörterbuch arabischer Pflanzennamen* (1912); etc. In collaboration with Ratzel he also published *Emin Pascha: Reisebriefe und Berichte* (1888).

SCHWEINFURTHERS, shwīn'fĕr-tĕrz. See Church Triumphant, The.

SCHWEINITZ, shvī'nĭts, Edmund Alexander de (1825–87). An American bishop of the Moravian church. He was born at Bethlehem, Pa., and studied theology at the Moravian Seminary there and at Berlin. He entered the ministry in 1850 and, after some years of pastoral life, became in 1870 Bishop of the Moravian church. He founded the *Moravian,* the weekly journal of his church, in 1856 and for 10 years was its editor. He was the author of *The Moravian Manual* (1859); *The Moravian Episcopate* (1865); *The Life and Times of David Zeisberger* (1870); *Some of the Fathers of the Moravian Church* (1881); *The History of the Church Known as the Unitas Fratrum;*

or, The Unity of the Brethren, Founded by the Followers of John Huss (1885). Consult his *Memoir* (Bethlehem, 1888).

SCHWEINITZ, Emil Alexander de (1866–1904). An American bacteriologist, son of Bishop Edmund A. de Schweinitz. He was born at Salem, N. C., graduated at the University of North Carolina in 1882 and at Göttingen in 1886, became connected with the chemical division of the Agricultural Department, Washington, D. C., and in 1890 was appointed director of the biochemical laboratory of the Bureau of Animal Industry of that department. He was also appointed to the chair of chemistry and toxicology in the Columbian University and later its dean. He made an especial study of hygiene and of bacterial products, of tuberculosis and hog cholera, and published, among other essays, *Laboratory Guide* (1898).

SCHWEINITZ, George Edmund de (1858–). An American ophthalmologist, son of Bishop Edmund A. de Schweinitz, born in Philadelphia. He was educated at Bethlehem Moravian College and in the University of Pennsylvania (M.D., 1881), where he was lecturer on ophthalmology (1891–92). He was also professor in the Philadelphia Polyclinic, in Jefferson Medical College (1891–92), and in the University of Pennsylvania from 1902. He wrote *Diseases of the Eye* (1892; 7th ed., 1910), *Toxic Amblyopias* (1896), *Diseases of the Eye, Ear, Nose, and Throat* (1899), and contributed to the *American System of Obstetrics* (1889), the *Cyclopædia of Diseases of Children* (1890), and the *System of Therapeutics* (1892).

SCHWEINITZ, Louis David von (1780–1834). An American botanist, born at Bethlehem, Pa. He studied in Germany, entered the ministry of the Moravian church, and held ecclesiastical office at Salem, N. C., and Bethlehem. By his botanical researches he added to the list of American flora more than 1400 species, of which more than 1200 were fungi. He bequeathed to the Academy of Natural Sciences of Philadelphia his herbarium, at the time of his death the largest private collection in the United States. His works include a *Conspectus Fungorum Lusatiæ* (1805), *Specimen Floræ Americæ Septentrionalis Cryptogamieæ* (1821), and a *Synopsis Fungorum in America Boreali Media Degentium* (1832).

SCHWEINITZ, Rudolf (1839–96). A German sculptor, born at Charlottenburg. He studied at the Berlin Academy under Schievelbein and after further training in Paris, Copenhagen, and Rome became his master's assistant. He worked on the exterior decoration of the National Gallery in Berlin, for which he designed a group of the three arts. He made the three colossal groups "Rhine," "Oder," and "Battle" for the King's Bridge in Berlin; eight reliefs on the City Hall, Berlin; and the reliefs on the Weichsel Bridge in Thorn, "Founding of the City of Thorn."

SCHWELM, shvĕlm. A town of Westphalia, Prussia, 23 miles east of Düsseldorf. There are iron, wire, enamel, and nickel works, with manufactures of wood screws, machinery, linens, and silks. Pop., 1910, 18,507.

SCHWENDENER, shvĕn'de-nēr, Simon (1829–). A German botanist, born at Buchs, Switzerland, and educated at Geneva and Zurich. He became professor and director of the botanical gardens at Basel in 1867 and at Tübingen in 1877, and professor of physiological botany at Berlin in 1878. He maintained that lichens were composed of algal cells, white cellular tissue, and spongy fungus, and explained the formation and development of plants by laws of mechanics. He wrote: *Ueber den Bau und das Wachstum des Flechtenthallus* (1860); *Die Algentypen der Flechtengonidien* (1869); *Das mechanische Prinzip im anatomischen Bau der Monokotylen* (1874); *Die mechanische Theorie der Blattstellungen* (1878); *Ueber das Winden der Pflanzen* (1881); *Zur Theorie der Blattstellungen* (1883); *Gesammelte botanische Mitteilungen* (1898).

SCHWENINGER, shvā'nĭng-ēr, Ernst (1850–). A German physician, born in Freistadt, Palatia. He studied medicine at Munich (M.D., 1870) and for some years was in practice. His appointment to a chair at Berlin (1884) (against the wishes of the medical faculty) was largely due to his successful treatment of Bismarck for obesity. His method was a modified Banting. He retired to private life in Munich in 1905. Schweninger wrote *Dem Andenken Bismarcks* (1899).

SCHWENKFELD, shvĕnk'fĕlt, Kaspar von (c.1490–1561). A German religious reformer. He was born at Ossig in Silesia, was educated at Liegnitz and Cologne, and became a councilor at the court of the Duke of Liegnitz. It was mainly through his influence that the Reformation gained a footing in Silesia. His views differed from those of Luther, however, and he became separated from the other reformers and was regarded with suspicion. When the Lutheran principles became dominant in Silesia, Schwenkfeld voluntarily left the country in 1529 and thenceforth was driven from town to town and finally died at Ulm. Schwenkfeld laid special stress upon the primary importance of a renewal of the inner life and held that the organization of the Reformed church should grow spontaneously out of it. The humanity of Christ he believed to be progressive through its union with the divine nature, so that it partakes more and more of that nature without losing its identity. The Lord's Supper he taught was a sacrament of spiritual nourishment without change in the elements. In some respects he approached the positions of Zwingli, in others those of the Anabaptists, but without full agreement with either. Although never ordained, he preached often and effectively. His writings were numerous and, when the printing press was forbidden, were circulated in manuscript. His *Grosse Confession* (1540–47) contains the best presentation of his doctrine. An edition of his works is being published, edited by C. D. Hartranft and others, *Corpus Schwenchfeldianorum* (Leipzig, 1907 et seq.). Consult: O. Kadelbach, *Ausführliche Geschichte Kaspar von Schwenkfelds und der Schwenkfelder in Schlesien, der Ober-Lausitz und Amerika* (Lauban, 1860); F. Hoffmann, *Kaspar Schwenkfelds Leben und Lehren* (Berlin, 1897); F. W. Loetscher, *Schwenkfeld's Participation in the Eucharistic Controversy of the Sixteenth Century* (Philadelphia, 1907). See Schwenkfeldians.

SCHWENKFELDIANS, shvĕnk'fĕl'dĭ-anz, or **SCHWENKFELDERS,** shvĕnk'fĕl-dērz. The followers of Kaspar von Schwenkfeld (q.v.). Although, consistently with his principles, Schwenkfeld founded no church, and after his death an ecclesiastical organization was out of the question for his sympathizers, owing to the conditions of the times, nevertheless they held

meetings, and congregations came into existence in different parts of Germany, particularly in Silesia, as well as in Switzerland and Italy. They suffered much persecution. In 1734, 34 families emigrated from Silesia to Pennsylvania and settled in Montgomery and Berks counties, and others followed two years later. A school system was established in 1764, and a denominational organization in 1782. In 1914 they had six church buildings, six ministers, and about 1000 members. Their numbers have steadily diminished. Their church government is congregational and the services are nonliturgical. In Europe the Schwenkfeldians have become extinct. Consult H. W. Kriebel, *The Schwenkfelders in Pennsylvania* (Lancaster, 1904).

SCHWERIN, shvâ-rēn'. The capital of the Grand Duchy of Mecklenburg-Schwerin (q.v.), Germany, beautifully situated on Lake Schwerin and several smaller lakes, about 38 miles southeast of Lübeck (Map: Germany, D 2). The town is well built and has handsome churches. The fourteenth-century Gothic cathedral is an interesting brick edifice, restored in 1867–69; the tower, 385 feet high, was built in 1889. It contains the tombs of the grand ducal family. Near the cathedral is the Grand Ducal Library of 255,000 volumes. On an island in Lake Schwerin is the beautiful Grand Ducal Palace, an early Renaissance edifice, completed in 1857. The Grand Ducal Museum contains a picture gallery, with noteworthy works by German, Flemish, Dutch, and Italian masters. Other interesting features are the government offices, the arsenal, the Court Theatre, and the Gymnasium. The principal manufactures are musical instruments (especially pianos), wagons, machinery, dyes, furniture, cabinets, and bricks. Schwerin, of Slavic origin and the oldest town in Mecklenburg, is first mentioned in 1018 and received municipal privileges in 1161. Pop., 1900, 38,667; 1910, 42,518.

SCHWERIN, Kurt Christoph, Count von (1684–1757). A Prussian soldier, born at Löwitz, Pomerania. He entered the Dutch army as ensign in 1700, fought in the War of the Spanish Succession, and in 1706 became first lieutenant in the service of the Duke of Mecklenburg. He then entered the Prussian service, and Frederick William I sent him on several diplomatic missions. Frederick II made him Count and field marshal. In the First Silesian War he commanded a part of the Prussian army and won the battle of Mollwitz in 1741. He stormed Prague in the Second Silesian War and was killed during the battle of Prague in the Seven Years' War. Consult Varnhagen von Ense, *Biographische Denkmale* (Leipzig, 1873), and Schwebel, *Die Herren und Grafen von Schwerin* (Berlin, 1885).

SCHWERTE, shvĕr'te. A town of the Province of Westphalia, Prussia, 53 miles by rail northeast of Cologne. There is a Romanesque church with a carved altar and some good fourteenth-century stained glass. The ironworks and machine shops are extensive. Pop., 1900, 12,261; 1910, 13,706.

SCHWICKER, shvĭk'ĕr, Johann Heinrich (1839–1902). An Hungarian historian, born in New Beschenowa and educated to be a teacher. His works deal especially with the history, literature, and ethnology of Hungary, the more important titles being *Die Deutschen in Ungarn und Siebenbürgen* (1881); *Die Zigeuner in Ungarn und Siebenbürgen* (1883); *Das Königreich Ungarn* (1886), a biography of the Cardinal-Archbishop Pázmány (1888); the valuable *Geschichte der ungarischen Litteratur* (1889).

SCHWIND, shvĭnt, Moritz von (1804–71). A German historical painter and draftsman. He was born in Vienna, where he studied at the Academy and under Ludwig Schnorr. In 1828 he went to Munich, where Cornelius so aroused his enthusiasm that he changed his residence to that city. He was commissioned to decorate the Tieck room in the Royal Palace (1832–34) and painted 60 water-color designs, from the life of Charlemagne, for Hohenschwangau Castle. After a short visit to Rome he was called to Karlsruhe to decorate the new Kunsthalle, and there also executed allegorical compositions for the session room of the Upper Chamber and in oil "Knight Kurt's Bridal Procession" (1839; Karlsruhe Gallery). In 1844 he removed to Frankfort, where he painted for the Städel Institute "The Singers' Contest at the Wartburg" (1846), and thence went to Munich in 1847 as professor at the Academy. Schwind was the last and greatest of the German Romanticists; but he was thoroughly wholesome and modern in feeling, was free from sentimentality, and possessed naïve humor and a strong sense of the beautiful. He resuscitated the world of legend and fairy tale and, as in his three great aquarelle cycles, "Cinderella" (1854), "The Seven Ravens" (1858; Weimar Museum), and "The Beautiful Melusina" (1870; Vienna Museum), delighted to glorify the virtues and heroism of women. His sense of color was limited, and his large frescoes are unequal in merit. The best are those illustrating the "Life of St. Elizabeth," in the Wartburg (1854–55). Much of his best work is in the Shack Gallery, Munich, which contains "The Wedding Journey," "Count Gleichen Returning from the Crusades," and 31 other paintings. In 1866–67 he executed a cycle in fresco from the *Magic Flute*, in the Loggia, and 14 cartoons of scenes from operas for the foyer of the Opera House at Vienna. Besides some clever etchings there are unnumbered ingenious and humorous designs of all kinds to his credit. Consult the monographs by Führich (Leipzig, 1871), Holland (Stuttgart, 1873), Haack (Bielefeld, 1898 and 1904), Grautoff (Berlin, 1904), Weigman (containing complete catalogue and illustrations of works, Stuttgart, 1906), Pastor (Stuttgart, 1907), and Neideck (Hamm in Westf., 1907).

SCHWOB, shwōb, Mayer André Marcel (1867–1905). A French author, born at Chaville. He studied at Nantes and passed his *licence ès lettres* in 1888. Between 1891 and 1900 he wrote some rather unusual stories and novels, such as *Cœur double, Le roi au masque d'or, Le livre de Monelle, Mimes, La porte des rêves.* In 1894 he published a translation of Defoe's *Moll Flanders* and in 1898, with Eugène Morand, translated *Hamlet* for Madame Sarah Bernhardt. He made exhaustive studies in the life and times of Villon, in 1902 collaborated with F. Marion Crawford in a play, *Francesca da Rimini*, and published later *La lampe de Psyché* (1903) and *The Children's Crusade* (1905).

SCHWYZ, shvêts. One of the forest cantons of Switzerland (Map: Switzerland, C 1). Area, 351 square miles. Schwyz belongs wholly to the region of the Lower Alps. A central ridge having a maximum altitude of 7594 feet forms a divide between the watersheds of Lakes Lu-

cerne and Zurich. On either side there are numerous branching spurs inclosing the valley of the Sihl on the north and that of the Muota on the south. From the latter rise the outliers of the Urner and Glarner Alps.

Schwyz is essentially a pastoral region; stock raising is the principal occupation. The forests cover nearly one-fourth of the area. Marble and gypsum are found. The principal manufacturing industry is cotton spinning. Silk weaving is developed to some extent as a house industry.

The Legislative Assembly (Grosser Rat) is elected for four years at the rate of one member to every 600 inhabitants. The Executive Council consists of seven members elected by the people for four years. Proportional representation for election to the Legislature prevails in all communities entitled to three or more members. The obligatory referendum and the initiative are in force. Pop., 1910, 58,347, almost entirely Roman Catholic. German is mostly spoken.

Schwyz, which gives its name to Switzerland, was in early mediæval times a free community tenacious of its rights and frequently embroiled over pastoral privileges with the powerful abbey of Einsiedeln (q.v.), which eventually came under its protection. With Uri and Unterwalden it formed in 1291 the celebrated league of resistance against Austria and defeated the Austrian forces at Morgarten Pass in 1315 and at Sempach in 1386. The second victory insured the independence of the Schwyzers, and they subsequently extended the authority of the Landsgemeinde over a considerable territory. They strenuously opposed the Reformation as members of the league formed to inaugurate the Counter-Reformation. In 1798 they spiritedly resisted the French, but suffered severely during the French campaign against the Russians in Switzerland in 1799. Schwyz remained stanchly conservative against constitutional changes and became a member of the Sonderbund, sharing in the defeat of the Catholic cantons in the war of 1847, which was followed by a revision of the constitution.

SCHWYZ. The capital of the Canton of Schwyz in Switzerland, situated in a deep basin formed by the Myten, the Rigi, and the Fronalpstock, about 10 miles southwest of Einsiedeln (Map: Switzerland, C 1). Its town hall, embellished with frescoes and portraits, and the parish church possess interest. Pop., 1900, 7398; 1910, 7854.

SCHYNSE, shĭn'se, AUGUST (1857–91). A German Catholic missionary and African explorer, born at Wallhausen, near Kreuznach, and educated at Bonn. He attended the seminary at Speyer, became a priest in 1880, and in 1882 entered the service of the African Mission and was active in the work in Algeria. He was one of a mission expedition to the Congo in 1885. This trip he described in his diary, *Zwei Jahre am Kongo* (1889). In 1888 he made a trip to East Africa and from there accompanied Stanley and Emin Pasha to the coast. With Emin he went to the Victoria Nyanza and then spent almost a year in explorations between that lake and Uganda. He wrote *Mit Stanley und Emin Pascha durch Deutsch Ost-Afrika* (1890). Consult Hespers, *Pater Schynses letzte Reisen* (Cologne, 1892), and *Pater August Schynse und seine Missionsreisen in Afrika* (Strassburg, 1894).

SCHYTTE, shēt'tĕ, LUDWIG (1850–1909). A Danish pianist and composer, born at Aarhus (Jutland). At first he studied chemistry, and not until his twenty-second year did he begin to study music with Neupert and Gade. Later he studied with Taubert in Berlin and with Liszt in Weimar. In 1887–88 he taught piano at Horák's Institute in Vienna. In 1907 he was appointed professor in Stern's Conservatory in Berlin. His numerous compositions for piano are distinguished for grace and melodiousness. He also wrote a concerto for piano and orchestra; an opera, *Hero* (1898); and the operettas *Der Mameluk* (1903) and *Der Student von Salamanka* (1909). Another operetta, *Fahrendes Volk*, remained manuscript.

SCIACCA, shăk'kà. A seaport in the Province of Girgenti, Sicily, 45 miles south-southwest of Palermo (Map: Italy, D 6). It has an eleventh-century cathedral, ruins of castles, a technical school, and a library. There are potteries, anchovy fishing, and a trade in grain and oil. Sciacca was an important city in the Middle Ages. Pop. (commune), 1901, 20,090; 1911, 24,645.

SCIÆNIDÆ, sī-ĕn'ĭ-dē (Neo-Lat. nom. pl., from Lat. *sciæna*, from Gk. *σκίαινα, skiaina*, sort of sea fish, maigre, from *σκιά, skia*, Skt. *chāyā*, shadow). A large and important family of spiny-rayed fishes, the grunters, with considerable resemblance to the perches, having a compressed body. The scales are ctenoid and arranged in oblique rows. The family includes the weakfish, drums, croakers, etc. There are 30 genera and about 150 species, found in all warm seas, but never in deep water. A few species are restricted to fresh waters. Many grow to a large size. Most of them are valued as food fishes, and some are interesting game fishes.

SCIALOIA, shà-lō'yà, ANTONIO (1817–77). An Italian economist and patriot, born at San Giovanni del Teduccio in Campania. Educated for the law, he published in 1840 *I principi dell' economia sociale*, a book which at once brought the young writer to the notice of European economists. As a consequence he was appointed professor of political economy at Turin. Actively interested in the movements which resulted in the unification of Italy, Scialoia was called into the Treasury by Cavour, entered the Lower House of Parliament, and later became Senator. He held the portfolio of Finance from 1865 to 1867, at an exceedingly trying epoch of Italian affairs, and in 1872 was Minister of Education. Three years later he spent some months in Egypt reorganizing the finances of the country. Among his economic and legal works may be mentioned, in addition to the *Principi: Industria e protezoine* (1846); *Brevi note sulle tontine e sull' arte* (1853); *Carestia e governo* (1854); *I bilanci del regno di Napoli e degli Stati Sardi* (1857); *Riordinamento dei tributi ed altri disegni di legge* (1867).

SCIATICA, sī-ăt'ĭ-kà (ML., from *sciaticus*, from Lat. *ischiadicus*, from Gk. *ἰσχιαδικός, ischiadikos*, subject to pains in the loins, from *ἰσχιάς, ischias*, pain in the loins, from *ἰσχίον, ischion*, socket of the thigh joint). A neuralgia of the great sciatic nerve. (See NERVOUS SYSTEM AND BRAIN.) It occurs in persons of a gouty or rheumatic tendency and is brought on by exposure, muscular strain from hard labor, pressure from hard seats, and constipation. As a symptomatic affection it may be caused by the pressure of pelvic tumors, injury to the nerves,

inflammations, and spinal disease. It also occurs occasionally in phthisis and diabetes. Sciatica is characterized by irregular pains about the hip, especially between the great trochanter of the thigh bone and the bony process on which the body rests when sitting (tuberosity of the ischium), spreading into the neighboring parts and running down the back of the thigh into the leg and foot. The pain is almost continuous, with paroxysms of great severity in which the pain is sharp, burning, and stabbing in character. The disease is very obstinate and tends to become chronic. In treatment a most important indication is rest, which is sometimes made more complete by the application of a splint to the limb. The medicinal treatment depends upon the underlying constitutional condition, with morphine, antipyrine, and like drugs to relieve pain. When the disease becomes chronic, the galvanic electric current is indicated. Wet cupping is often useful. Injection into the nerve of normal saline solution, weak cocaine solution, or urea and quinine hydrochloride will sometimes produce a cure. More heroic measures, however, are sometimes employed, viz., blistering, the actual cautery, acupuncture (q.v.), and nerve stretching. This may be done by putting the patient on his back and flexing the thigh strongly upon the abdomen. A more thorough method consists in cutting down on the nerve, just below the gluteal fold, the incision extending downward 4 inches. The nerve is exposed, freed from its bed, raised on a blunt hook, and stretched for several minutes. This method has been successful in alleviating the pain in many cases.

SCICLI, shē'klē. A town in the Province of Syracuse, Sicily, 38 miles southwest of Syracuse (Map: Italy, E 6). Pop. (commune), 1901, 16,277; 1911, 17,542 (town, 15,917).

SCID'MORE, Eliza Ruhamah (1856–). An American author, born at Madison, Wis. She became widely known as a traveler and as a writer of books of travel and was made corresponding secretary of the National Geographic Society. Her published works include: *Alaska, the Southern Coast and the Sitkan Archipelago* (1885); *Jinrikisha Days in Japan* (1890); *Java, the Garden of the East* (1897); *China, the Long-Lived Empire* (1900); *Winter India* (1903); *As the Hague Ordains, the Journal of a Russian Prisoner's Wife in Japan* (1907).

SCIENCE, Associations for the Advancement of. See Advancement of Science, Associations for the.

SCIENCE, Mental. See Knowledge, Theory of; Mental Science; Philosophy; Psychology.

SCIENCE, Social. See Sociology.

SCIENCES (Lat. *scientia*, knowledge, from *scire*, to know), Classification of. From early times attempts have been made to arrange all the sciences in a systematic order which shall clearly show their relations to each other. The result of such an attempt depends, of course, partly upon the material to be classified and partly upon the principle used in classification, i.e., the *fundamentum divisionis* (see Division); it is also apt to be influenced by the partiality of the classifier in favor of some discipline which he wishes to place above all others.

In ancient Greece there were relatively few sciences, and the classification of such as existed was a comparatively easy matter. The Platonists divided the sciences into dialectics, physics, and ethics. Aristotle divided them into the theoretical, the practical, and the poetical (creative or technical). Interpreters are not agreed upon what he accepted definitively as the subclasses of the theoretical sciences. Some maintain that the subclasses are analytics (logic), metaphysics, and physics. Others say that he regarded logic merely as propædeutic to the sciences and that the theoretical sciences were divided into mathematics, physics, and the "first philosophy" (metaphysics). The practical sciences included ethics and politics, although Aristotle seemed at times to regard ethics merely as a branch of politics. The technical sciences were of two kinds, the useful and the imitative.

In modern times Bacon (1605) uses as principle of division the so-called faculties of the mind, some one of which was by him supposed to be predominantly active in each of the several sciences. These faculties were memory, imagination, and reason, and they gave rise respectively to history, poesy, and philosophy. "History is natural, civil, ecclesiastical, and literary; whereof the first three I allow as extant, the fourth I note as deficient." These are again subdivided. Poesy is divided into "poesy narrative, representative, and allusive." "In philosophy, the contemplations of man do either penetrate unto God, or are circumferred to Nature, or are reflected or reverted upon himself. Out of which several inquiries, there do arise several knowledges, divine philosophy, natural philosophy, and human philosophy or humanity." "Natural science or theory is divided into physic and metaphysic." Physic should contemplate that which is inherent in matter and therefore transitory, and metaphysic that which is abstracted and fixed. "Metaphysic includes the inquiry into formal and final causes and mathematics. Mathematics is divided into pure and mixed, the former including geometry and arithmetic, the latter including perspective, music, astronomy, cosmography, architecture, enginery, and divers others." "Physics hath three parts. The first doctrine is touching the contexture or configuration of things. . . . The second is the doctrine concerning the principles or originals of things. The third is the doctrine concerning all variety and particularity of things, whether it be of the differing substances, or their differing qualities and natures."

Hobbes gives a most ingenious classification in the *Leviathan* (1651). Science is for him "Knowledge of Consequences," and according to the differences of the kind of "Consequences" there will be a grouping of the knowledge involved. Those curious of details are referred to the ninth chapter of the above-mentioned work.

Early in the nineteenth century three ambitious classifications were proposed—one by Bentham (1816), one by Comte (1830), and one by A. M. Ampère (1834). Bentham's and Ampère's agree in being dichotomous and characterized by highly artificial terminologies, which form one of the curiosities in the history of science. Both also agree in dividing the sciences into those dealing with body and those dealing with mind. The former Bentham calls somatology, and the latter pneumatology. Somatology is divided into posology (mathematics), or the science of pure quantity, and poiology, or the science which deals with qualities. Posology is divided into morphoscopic (geometrical) and alegomorphic (arithmetrical) posology. The latter

is further subdivided into gnosto-symbolic and agnosto-symbolic. The former term is his designation for common arithmetic, and the latter for algebraical arithmetic. Poiology is divided into physiurgy (natural history) and anthropourgy (natural philosophy). Physiurgy is divided into uranoscopy (astronomy) and epigeoscopy (terrestrial natural history). Epigeoscopy is divided into abioscopy (mineralogy) and embioscopy (physiology). All these are again subdivided and sub-subdivided till one has a fairly complete Greek dictionary at last. The divisions of anthropourgy the inquisitive will find given in infinite detail in the *Chrestomathia*.

Perhaps the best-known and the most thoroughly discussed classification ever made is Comte's, given in his *Cours de philosophie positive*. The division is not by genus and species, but by hierarchical order. "The classification," he says, "must proceed from the study of the things to be classified and must by no means be determined by a priori considerations. The real affinities and natural connections presented by objects being allowed to determine their order, the classification itself becomes the expression of the most general fact. . . . It follows that the mutual dependence of the sciences—a dependence resulting from that of the corresponding phenomena—must determine the arrangement of the system of human knowledge." Applying this method, Comte concludes that there are six sciences. "We cannot make them less, and most scientific men would reckon them as more. Six objects admit of 720 different dispositions. . . . Our problem is, then, to find the rational order, among a host of possible systems." "The true order is determined by the degree of simplicity, or, what comes to the same thing, of generality," of the phenomena which are the objects of scientific investigation. This order turns out to be mathematics, astronomy, physics, chemistry, physiology, and social physics, for the last of which Comte invented the now current name, "sociology." The correctness of this order, he argues, is confirmed in various ways. For instance, in education, this is the order in which the sciences must be studied. An astronomer must have learned his mathematics. "Physical philosophers cannot understand physics without at least a general knowledge of astronomy; nor chemists without physics and astronomy; nor physiologists without chemistry, physics, and astronomy; nor, above all, the students of social philosophy, without a general knowledge of all the anterior sciences. As such conditions are as yet rarely fulfilled, and as no organizations exist for their fulfillment, there is among us, in fact, no rational scientific education."

Herbert Spencer in 1854 suggested a classification of the sciences which he later worked out in detail in his famous essay *The Classification of the Sciences* (3d ed., 1871). He begins by criticizing Comte's scheme on account of the identification the latter made of the abstract and the general. "Abstractness," he insists, "means detachment from the incidents of particular cases. Generality means manifestation in numerous cases." Not degree of generality —as by Comte—but of abstractness is by Spencer regarded as the proper basis for division of the sciences. Applying this principle of division, he obtains three classes of sciences—the abstract, the abstract-concrete, and the concrete.

One of the most carefully worked out classifications ever published is that presented in Wundt's *Logik*. He objects to most previous classifications because they attempt to force some arbitrary schematism upon the facts. One must find the scheme in the facts themselves, he argues, and these facts are not the object matter of the sciences, but the points of view which the various sciences take of their object matter. The point of view of a science is a conceptional point of view. It is taken in order that from this vantage ground we may survey the facts and bring them into intelligible relations. This point of view determines the method pursued by any science. As sciences are distinguished by their conceptional points of view, Wundt classifies them according to these points of view. The first division, according to this principle, is into the special sciences and philosophy. The special sciences deal with facts from some single point of view; philosophy takes a more comprehensive survey of our knowledge of these same facts. "While the special sciences divide knowledge into a great number of objects of knowledge, the eye of philosophy is from the start directed towards the organic unity (*Zusammenhang*) of all these objects of knowledge."

In surveying all these classifications the question arises whether any one classification is possible which can claim validity to the exclusion of the others. As was observed at the outset, a classification depends, among other things, upon the principle employed. Is only one principle applicable in the classification of the sciences? To answer this question affirmatively seems to be dogmatic. The various sciences are related in various ways, and why any single one of these ways should be chosen as the sole possible basis of valid classification it is difficult to see. The dogmatism of such an assumption can be illustrated by referring to the classification of books in a library. A library may be arranged alphabetically, or chronologically, or topically, etc. No one of these arrangements is the only proper one. Which shall be chosen depends upon the use to which the classification is to be put.

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ed., vols. i–iii, Berlin, 1907–15); François Maugé, *La systematisation dans les sciences* (Paris, 1909); Karl Pearson, *Grammar of Science* (3d ed., London, 1911).

SCIENCES, National Academy of. See National Academy of Sciences.

SCIENTIFIC ALLIANCE OF NEW YORK, The. An association of scientific bodies with headquarters at the New York Botanical Gardens and including the resident active members of the New York Academy of Sciences, the Torrey Botanical Club, the New York Microscopical Society, the Linnean Society of New York, the New York Mineralogical Club, and the New York Entomological Society. The Council of the Scientific Alliance is composed of the president and two members from each of the allied societies. In 1915 the alliance had a total membership of about 1000.

SCIENTIFIC MANAGEMENT. That management of industry, or any other human occupation, which is an art based upon a science, i.e., upon laws deduced from organized knowledge obtained from measurement. It has been called, also, measured, functional management, because it rests upon measurement and results in functionalization of work, in assigning to each member of the organization that work that is the highest type that he is fitted to do or can be fitted to do.

History. It is difficult to trace the early history of the science of management. Certainly, since the beginning of the eighteenth century and the time of Adam Smith, Coulomb, and Babbage, it has been recognized that there is enormous waste in the ordinary practice of management. These early thinkers saw that specialization of workers and the accompanying functionalization of work were marks of excellence in management and resulted in increased output and in increased skill of the worker. From that time on there was constant and conscious endeavor to provide devices to increase output and to conserve specialized skill. But it was not until the latter part of the nineteenth century that it was recognized that, in order to become efficient, management must become a science, i.e., must submit itself to accurate measurement and must organize the results of this measurement into a standard, working practice. The important elements of this measurement were time study and motion study. Motion study is the dividing of the elements of any operation into the most fundamental subdivisions possible; studying these fundamental elements separately and in relation to one another; and from these studied, chosen units, when timed, building up methods of least waste. Time study consists of timing the elements of the best method known, and from these elementary unit times synthesizing a standard time in which a standard man can do a certain piece of work in accordance with the finally accepted method. The application of these methods of measurement is twofold: first, to the machinery, tools, and equipment—or the "material" factor of the work done; and, second, to the human factor. Measurement may be applied, e.g., to the speed and amount of output of a machine, to the mental reaction of a worker, or to the methods of a worker running a machine—in which last case both the "material" element and the human element have to be considered. In any case the result of the measurement is a unit which is known, because it has been actually measured, and which may thus be compared with other measured units and finally used as an element of a standard. With the measurement of the human element came a recognition of the importance of fatigue and a more intensive study of the mechanism of the worker, both from the physiological and the psychological points of view. There came, also, with the growing consciousness that coöperation lies at the base of success in management, a recognition of the importance of the social relation and of the necessity of education, not only of the individual worker, but of the entire community, that such coöperation may be fostered.

Principles. Taylor gives eight principles as underlying good management: 1. The development of a science for each element of a man's work, which replaces the old rule-of-thumb method. 2. An almost equal division of the work and the responsibility between management and workman. 3. A clearly defined and circumscribed task. 4. Such conditions that the daily task can always be accomplished. 5. High pay in case the task is successfully done. 6. Low pay in case of failure. 7. The scientific selection, training, teaching, and developing of the workman. 8. Hearty coöperation between management and men.

Measures or Tests. Underlying these eight laws are nine fundamental ideas or tests that management that claims to be a science must pass. 1. It must conserve and foster *individuality*, giving every man working under it a chance to be a specialist and an opportunity to be relieved of all work except that which he can do best. 2. It must *functionalize* work; i.e., so divide it that each man can develop his individuality. 3. It must apply accurate *measurement* and use the results of such measurement only. 4. Its methods must be constructive, *analyzing* material into elements, testing each, and then eliminating useless elements and combining or synthesizing those elements that stand proved as necessary into new, efficient methods. 5. It must *standardize* the results of measurement and refuse to change a standard unless the proposed change shows itself better by actual, accurate measurement. 6. It must *record* experience, in order to predict the future or provide adequate programmes. 7. It must *teach* each man working under it to follow the definite path of promotion that is laid down for him. 8. It must provide sufficient *incentives* to make each man contented, yet progressive. 9. It must provide for *welfare*, physical, mental, and moral, laying special emphasis upon the necessity for and benefits of coöperation.

Application of Tests to Scientific Management. If we apply these nine tests to scientific management, we discover: 1. Under scientific management the worker becomes more of an individual, since he is selected scientifically, has individual teaching, an individual task, and an individual reward. 2. The entire work of the organization, both that of the management and that of the workers, is functionalized or separated into various units, each of which is of such a type that it will demand the best efforts of a certain type of man. The progression from one position to another is so arranged that it is possible for a man to pass from the place where he starts to any other place in the organization that he is able to fill. 3. The application of accurate methods of measurement,

such as motion study and time study, enables the worker to make the most of his strength and capacity through the use of a standard set of motions which accomplish the most work with the least amount of fatigue. Work is classified according to the amount of time and effort which it takes and the amount of fatigue which it causes. Managers and workers are taught their individual capacities and a method of attack applicable to any problem. Men, methods, and equipment can be accurately selected; individuals can be assigned to that work which they are best fitted to do; methods can be properly prescribed; and adequate and fitting rewards can be provided. Prediction is possible, and thus calendars, charts, and schedules can be made and carried out. This adds interest to the work and induces coöperation. 4. Every method is subjected first to the analytic and then to the synthetic process. As a result the worker learns to think in elementary units and then to construct norms of conduct and action from the results of his thinking. 5. Standardization is used as a maintaining force. It not only enables successes to be repeated, but provides instruction for the teaching of the worker. The process as well as the result of standardizing work trains the mind of all interested to better methods of thinking. Initiative is provided for by reducing all minor details to routine or habit and by directing the inventive individual into lines where his activity may be productive. 6. Records form an important part of the science of management. Records of output, of cost, of materials, of tools, of methods, of initiative, of behavior, and of achievement are kept. No records are made which do not in themselves, either directly or indirectly, reduce costs. These records result in programmes which are reasonably sure of fulfillment. These result in a coöperative attitude of mind between worker, management, customer, and ultimate consumer. 7. In contrast to the usual teacher under traditional management, who had no training as a teacher, little desire to be a teacher, and often a lurking fear lest his temporary pupil supplant him, the teacher under scientific management coöperates fully with the learner. His own advancement depends upon training some one to take his place; therefore the incentive is to make the teaching as excellent and efficient as possible. The teaching is done through standards, particularly the standard instruction card, which tells exactly how the work is to be done; prescribing methods in full detail; through systems which present the underlying reasons for doing the work as it is done; and through personal, individual instruction from functional foremen. The result is not only that the work of the learner improves, but that his mental capacity increases, his senses are trained, his attention is stimulated, he is taught right habits of thinking and acting. He imitates and emulates and builds up new wholes out of the elements that are given to him. His will is developed, for he is taught proper interests and how to keep his attention concentrated upon them. As a by-product of such teaching and learning, skill is both conserved and transferred, with the result that there is no need of repeating an investigation once made, and that progress can start from the highest achievements of the past and the present. 8. Under scientific management the incentive becomes an object of careful study. The reward is always positive, i.e., a definite gain to the man winning it, not merely a taking away of a drawback. It is predetermined, the man knowing beforehand what he will get. It is personal, a reward for the particular man and the particular work. It is fixed, so that the man gets exactly what he is promised, and gets it successfully, as often as he wins out. It is assured, with the result that the worker's entire attention is concentrated upon his work. And it is prompt, thus holding the interest through the completion of the work. 9. General welfare is provided for by the fundamental plan of the type of management itself. The regularity of the work periods and the provision of rest periods lead to physical improvement, as does the fact that each worker is assigned suitable work. Standardization and teaching permit good habits to be formed and retained and lead to mental development. Moral development is provided for by giving to every man personal responsibility as well as responsibility for others, by teaching self-control, and by rewarding effort. Since the success of the management depends absolutely upon the spirit of coöperation that is aroused and maintained, permanent welfare is assured.

Application of Scientific Management. The difference between traditional management, or the ordinary type of management, and scientific management is shown plainly by a comparison of their methods of operation. Under the traditional or military type of management the planning is not separated from the performing, but the power of managing lies, theoretically at least, in the hands of one man. The line of authority and of responsibility is fixed and single. Each man comes in contact with but one man above him and is in charge of all those below him. It is almost impossible to measure and standardize the duties of any position; therefore it is impossible to assign any man to that work which he is best fitted to do. (See Fig. 1.) Under scientific management the planning is separated from the performing, all those having desire or fitness for either type of work being assigned to the appropriate division.

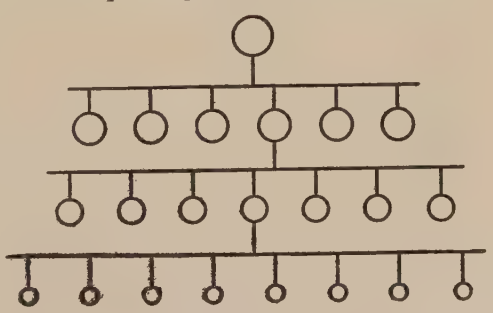


FIG. 1. Diagram illustrating the routes of authority under the traditional or military type of management.

Each division is divided into five functions. In the planning department they are: 1. The *superintendent*, whose duties are to see that the proper person is in charge of each function of the management and to inspect the product of the plant on the exception principle. The *product* is here taken to mean the output of the plant, both articles manufactured and type of worker resulting from the work. Only results

which are exceptionally good or exceptionally bad come to the superintendent's attention. In this way he is utilized according to the line of his highest efficiency only. 2. *Order of Work and Route Man.*—The duties of this function are to determine *who* is to do the work, *when* it is to be done, and *where* it is to be done, and thus to lay out the most efficient day's work for each worker and the least wasteful paths and sequences of transportation for each piece of work. 3. *Instruction-Card Man.*—The duty of this function is to determine the *how* and prescribe the method. 4. *Time and Cost Clerk.*—The duty of this function is to keep accurate records as to *how much* time and cost are required for each unit operation, and thus to be able to predict future time and cost. 5. *Disciplinarian.*—The duty of this function is to supply the *why*, to adjust all difficulties arising between individuals, and to stimulate, foster, and maintain the spirit of coöperation throughout the entire organization. The five divisions in the performing department are: 6. *Gang Boss or Teacher.*—The duty of this function is to see that the worker has work and equipment at hand and to teach him how the work is to be performed. 7. *Speed Boss or Regulator or Controller of Machines and Equipment.*—The duty of this function is to see that all machinery and equipment is capable of working at the speed prescribed and to demonstrate that the speed prescribed can be obtained. 8. *Repair Boss or Preventer of Breakdowns and Delays.*—The duty of this function is to keep machinery in such condition that the prescribed method can be applied in the prescribed time. 9. *Inspector or Maintainer of Quality.*—The duty of this function is to maintain the quality of the output and also to insure, by watching the worker during the learning process, that quality of workmanship and correct habits of work are insisted upon. 10. *Individual Workman.*—The duties of this function are to concentrate upon doing, according to exact and scientifically derived methods, expert work.

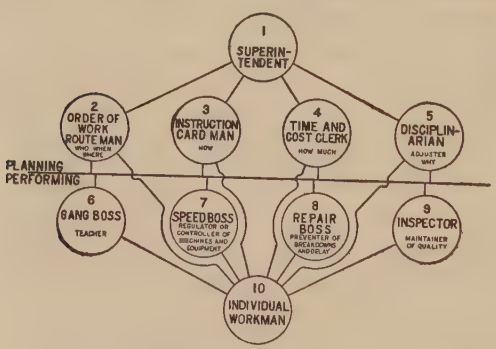


FIG. 2. Diagram illustrating the principle of functional or scientific management.

The interrelation between these functions is best represented, not by lines of authority, but by lines or paths of teaching and coöperation, which connect each function with every other. (See Fig. 2.)

Field of Application. Scientific management, applied at first in the industries only, is at present found in office work as well as field work; it is being introduced in the management of educational and civic institutions as well as in the household, and is receiving widespread application as translated into the vocabulary of personal efficiency. Its underlying principles have been, perhaps, up to the present time, somewhat restricted in their field of usefulness, because of having been stated in the vocabulary of industrial efficiency; but these are being fast translated into the vocabularies of all lines of human usefulness, and with this has come a realization that their true field of applicability is practically unlimited.

Results. Scientific management results in increased output and wages and decreased cost of production. It results in the elimination of waste; in cutting out all unnecessary fatigue and in furnishing rest for necessary fatigue; in putting an emphasis upon coöperation, which is the ultimate assurance of its right to live. It is increasingly attracting advocates and exponents; it is being introduced into an increasing number of industrial plants; and it has never been discarded where it has been entirely installed and thoroughly understood. Its chief strength lies in the spread of its underlying spirit, which is manifesting itself, consciously and unconsciously, in all lines of activity.

In this connection reference can be made with profit to the articles on ACCOUNTING; EFFICIENCY; MANAGEMENT, LEGISLATIVE; MOTION STUDY; PREMIUM PLAN; RAILWAYS; TASK AND BONUS; TIME STUDY; UNIT SYSTEM; and the references there given for further information on management and industrial organization.

SCILLA, sĭl'lȧ. See SQUILL.

SCILLY (sĭl'lĭ) **ISLANDS**, or ISLES OF SCILLY. A group of small islands belonging to Cornwall, England, about 25 miles west-southwest of Land's End (Map: England, A 6). The group consists of about 140 islands and rocks, comprising a circuit of 30 miles. The islands have been regarded as the high points of the traditional submerged land of Lyonesse. The islands distinguishable from mere rocks number about 40; they comprise five civil parishes, which bear the names of the principal islands and have a total area of 4041 acres: St. Mary's, with 1611 acres and 1376 inhabitants in 1911; Tresco, 962 and 315; St. Martin's, 682 and 191; St. Agnes, 433 and 102; Bryher, 353 and 113. Total pop., 2097 (2092 in 1901). Navigation about the islands is dangerous. The climate is mild. The soil in general is sandy, but in Tresco and St. Agnes it is remarkably fertile. The cliffs abound with sea fowl and are covered with samphire. The inhabitants are engaged chiefly in agriculture, floriculture, and fishing. Large quantities of potatoes are produced; narcissi and other flowers are sent to London and Bristol. Hugh Town, in St. Mary's, with harbor and roadstead, is the capital and contains an odd mixture of old-fashioned and neat modern houses. There are numerous remains of prehistoric monoliths, stone circles, kistvaens, rock basins, and cromlechs. The islands are administered by a council. For parliamentary purposes they are included in the St. Ives division of Cornwall. It has been supposed that these islands were known to the ancients under the name Cassiterides or "Tin Islands."

SCINDE, sĭnd. A region of British India. See SIND.

SCINDIA, or **SINDHIA**, sĭn'dĭ-ȧ. The name of a Mahratta dynasty, rulers of Gwalior in Central India. See SINDIA.

SCINTILLATION, sĭn'tĭ-lā'shŭn (Lat. *scin-*

tillatio, from *scintillare*, to sparkle, from *scintilla*, spark). The apparent twinkling or flickering of a star, including the changes of color that are seen when the stars are near the horizon. A satisfactory explanation of this phenomenon has been given by Exner, of Vienna, and others, by whom it is ascribed to the irregular refraction and interference of rays of light passing through the heterogeneous mixture of warm and cold air that ordinarily exists in the atmosphere. The minute streams of warm and cold air, oftentimes of a smaller diameter than that of the pupil of the eye, cause points on a large object to dance about while the object as a whole remains stationary. Therefore the edges of the sun or moon or planets appear to scintillate, while these objects as a whole are quite steady owing to their large apparent angular diameter. A star, however, appears as a mere point in space and its dancing about, accompanied by variations of both brightness and color due to the causes mentioned, gives the appearance of twinkling or flickering observed by the eye. The frequency and extent of the oscillations and changes of color may be observed by means of the scintillometer, by which the image of a star is drawn out into a circle, and the rapid changes of the light are seen distributed along the circumference. Regular observations have shown that scintillation is more decided before the approach of a storm, and in various ways this phenomenon is so connected with atmospheric changes as to form a regular subject of observation by some meteorologists.

SCIO, sī'ō *or* shē'ō. An island of the Ægean Sea. See CHIOS.

SCIOPPIUS, stsē-ŏp'pē-ŭs (Lat. form of *Schoppe*), KASPAR (1576–1649). A classical scholar and controversialist, born at Neumarkt in the Palatinate. He studied at Heidelberg, Altdorf, and Ingolstadt. In 1598 he became a Roman Catholic. Henceforth his career is a series of attacks both on Protestantism and on his personal enemies. He assailed first Joseph Justus Scaliger (q.v.). In 1611 he attacked King James of England in libelous pamphlets. Among his numerous works the most important are: *Poemata Varia* (1593); *Verisimilia*, on classical Latin prose writers, a work in part plagiarized; *De Arte Critica* (1597); *Symbola Critica in Apuleii Opera* (1605); *De Rhetoricarum Exercitationum Generibus* (1628); *Grammatica Philosophica, sive Institutiones Grammaticæ Latinæ* (1628); *Rudimenta Grammaticæ Philosophicæ* (1629); *De Studiorum Ratione* (1636); and editions of Varro's *De Lingua Latina* (1605) and the *Epistles* of Symmachus (1608). Consult J. E. Sandys, *A History of Classical Scholarship*, vol. ii (Cambridge, 1908).

SCIOTO (sī-ō'tō) **RIVER.** A river of Ohio. It rises in Auglaize County, flows east and south through a fertile and populous valley in the centre of the State past the city of Columbus, and joins the Ohio River at Portsmouth after a course of 200 miles (Map: Ohio, D, E, 7 and 8). It is navigable 130 miles at high water, and its course is followed for 90 miles by the Ohio and Erie Canal.

SCIO TURPENTINE. See PISTACIA.

SCIPIO, sĭp'ē-ō. The name of a distinguished Roman patrician family of the Cornelia Gens (q.v.). 1. PUBLIUS CORNELIUS SCIPIO AFRICANUS MAJOR was born in 237 B.C. In the battle of the Ticinus against Hannibal (218 B.C.), he saved his father's life. He fought at Cannæ (q.v.) as a military tribune. In 212 he was elected ædile, though not legally qualified by age, and in 211 proconsul, with command of the Roman forces in Spain. By a bold and sudden march he captured (210) Carthago Nova, the stronghold of the Carthaginians, and obtained an immense booty. (See CARTAGENA.) At Bæcula, in the valley of the Guadalquivir, he defeated Hasdrubal, but could not prevent him from crossing the Pyrenees and marching to the assistance of Hannibal. (See HASDRUBAL, 3.) In 207 he won a more decisive victory over the other Hasdrubal, son of Gisco, and Mago, at an unknown place called Silpa, or Elinga, in Andalusia, which placed the whole of Spain in the hands of the Romans. He was elected consul in 205, though he had not yet filled the office of prætor, and in the following year he sailed from Lilybæum in Sicily, at the head of a large army, to invade Africa. His successes compelled the Carthaginian Senate to recall Hannibal (q.v.) from Italy. The great struggle between Rome and Carthage was terminated by the battle fought at Naragra, on the Bagradas, near Zama, Oct. 19, 202. Hannibal advised his countrymen to abandon what had now become a hopeless contest; when peace was concluded in the following year, Scipio returned to Rome and enjoyed a triumph and received the surname of Africanus. When his brother Lucius, in 190, obtained command of the army destined to invade the territories of Antiochus, King of Syria, Scipio served under him as legate. Lucius was victorious in the war, and on his return to Rome (189 B.C.) assumed the surname of Asiaticus. But the clouds were now gathering heavily round the Scipios. In 187 Cato Major and others induced two tribunes to prosecute Lucius for allowing himself to be bribed by Antiochus in the late war. He was declared guilty by the Senate, his property was confiscated, and he himself would have been thrown into prison had not his brother forcibly rescued him from the hands of the officers of justice. In 185 Scipio himself was accused by the tribune, M. Nævius, but, instead of refuting the charges brought against him (which were probably groundless), he delivered, on the first day of his trial, a eulogy on his own achievements and opened the second day by reminding the citizens that it was the anniversary of the battle of Zama and therefore not a time for angry squabbling but for religious services. He then summoned the people to follow him to the Capitol to give thanks to the gods and to pray that Rome might never lack citizens like himself. His audience was electrified, and the thing proposed by Scipio was done before opposition became possible. To resume the trial was out of the question; but Scipio retired to his country seat at Liternum in Campania, where he died 185 or 183 B.C. Scipio is commonly regarded as the greatest Roman general before Julius Cæsar.

2. PUBLIUS CORNELIUS SCIPIO ÆMILIANUS I, AFRICANUS MINOR, born about 185 B.C., was a younger son of Lucius Æmilius Paulus (q.v.), but was adopted by his kinsman, Publius Scipio, son of Scipio Africanus Major, who had married the daughter of the Lucius Æmilius Paulus who fell at Cannæ. Scipio fought at Pydna (168). In 151 he went to Spain as military tribune and distinguished himself alike by his valor and his virtue. When, in 149, the Third Punic

War, which mainly consisted in the siege of Carthage (q.v.), began, Scipio still held the subordinate position of military tribune; but the brilliant manner in which he rectified the blunders of the consuls Manius Manilius and Lucius Calpurnius Piso fixed all eyes on him. The favorite of both the army and the people, Scipio was in 147, when only a candidate for the ædileship, elected consul by an extraordinary decree of the Comitia and invested with supreme command. Carthage was finally taken by storm in 146. Scipio, though probably the most accomplished Roman gentleman of his age, was rigorous in his observance of the antique Roman virtues; when holding the office of censor in 142 he strove to follow in the footsteps of Cato. But his efforts to repress the increasing luxury and immorality of the capital were frustrated by the opposition of his colleague, Lucius Mummius (q.v.), the rough conqueror of Corinth. In 139 Scipio was accused of the *crimen majestatis* by the tribune Tiberius Claudius Asellus, but was acquitted, and soon after was sent to Egypt and Asia on a special embassy. Meanwhile affairs had gone badly in Spain. Viriathus (q.v.) had inflicted the most disgraceful defeats on the Roman armies and had roused the hopes of the Celtiberian tribes, who also rushed to war against the common foe. (See CELTIBERI.) The contest continued with varying success; but the interest centred in the city of Numantia (q.v.). It long seemed as if the Numantines were invincible, one consul after another finding their subjugation too hard a task; but at length, in 134, Scipio, reëlected consul, after a siege of eight months forced the citizens, who were dying of hunger, to surrender and utterly destroyed their homes. He then returned to Rome, where he took a prominent part in political affairs, as the leader of the aristocratic party. Although a brother-in-law of Tiberius Gracchus (q.v.), whose sister Sempronia he had married, he disclaimed any sympathy with his political aims. His attempts (129) to rescind that portion of the agrarian law (q.v.) of Tiberius Gracchus which related to the lands of the allies excited furious indignation. When he went home from the Senate, he had to be accompanied by a guard. Next morning he was found dead in his bed. Scipio was neither a rigid aristocrat nor a flatterer of the people. Inferior in splendor of genius to his adoptive grandfather, he surpassed him in purity of character, in simplicity of patriotism, and in liberality of culture.

3. QUINTUS CÆCILIUS METELLUS PIUS, a son of P. Cornelius Scipio Nasica, but adopted by Quintus Cæcilius Metellus Pius; called sometimes Publius Scipio Nasica, sometimes Quintus Metellus Scipio. In 63 B.C. he divulged to Cicero the conspiracy of Catiline. Having been elected tribune in 60, he was accused of bribery by the disappointed candidate and defended by Cicero. During the anarchy that followed the murder of Clodius (q.v.) Pompeius (Pompey the Great) was made consul without a colleague. Soon after he married Scipio's daughter, Cornelia, and made Scipio his fellow consul. Thenceforth Scipio's efforts were directed towards the aggrandizement of Pompeius and the overthrow of Cæsar. At the expiration of his term of office he went as proconsul to Syria, where his rule was complained of as oppressive. He served with Pompeius in Greece, and after the battle of Pharsalus fled to Africa, where the remnants of the Pompeian forces had the support of King Juba (q.v.). Scipio held the chief command there, but was defeated by Cæsar at Thapsus (46) and committed suicide.

SCIPIOS, sĭp′ĭ-ŏz, TOMB OF THE. The famous tomb on the Appian Way in Rome, which once contained the sarcophagus of Scipio Barbatus (consul 298 B.C.), now in the Vatican, and those of later Scipios. It was discovered in 1780, when it was rifled and defaced.

SCIRE FACIAS, sī′rē fā′shĭ-ăs (Lat., that you make known). A writ commanding the defendant to appear in court and show cause, if possible, why some matter of record should not be enforced, vacated, or modified. The hearing or trial under this writ is usually called a scire facias proceeding. Scire facias is employed for many purposes and in general is merely supplemental to or a continuation of former proceedings, as to revive or continue the lien of a judgment; but in some cases it is practically an original action. A writ of scire facias must be founded upon some public record, either judicial or otherwise. The defendant may demur, plead, or answer, or make a motion to quash the writ. Substantially the same defenses are allowed as in an ordinary action (q.v.), except that where the scire facias proceedings are merely a continuation of a former action the defendant cannot introduce any defense which would have been available in the latter. A judgment may be entered upon the determination of the proceeding, and from this an appeal will lie. Scire facias proceedings were practically rendered unnecessary and obsolete in England by the Judicature Acts (q.v.), although not expressly abolished. In most of the United States other actions or proceedings have been substituted by practice acts and codes and proceedings by the writ of scire facias abolished. Consult Foster, *Scire Facias* (Philadelphia, 1851), and the authorities referred to under WRIT.

SCIRPUS, sĕr′pŭs (Lat., rush, bulrush). A genus of about 200 species of plants of the family Cyperaceæ, sometimes called club-rush, some of them very small in comparison with the bulrush (*Scirpus lacustris*). Deer's hair (*Scirpus cæspitosus*) is only 2 or 3 inches high. The rootstocks or tubers of certain species are eaten by the natives of southern India. Several of the larger growing species are used for making mats, others check the drifting of sand upon beaches. See BULRUSH.

SCISSORBILL. A bird, the skimmer (q.v.).

SCISSORS and **SHEARS.** See CUTLERY.

SCISSOR-TAILED FLYCATCHER. A beautiful flycatcher (*Milvulus forficatus*, or *Muscivora forficata*) of the southwestern United States, remarkable for its long outer dark-tipped tail feathers, which in flight open and shut like a pair of scissors. The body is about 3½ inches long, the tail about 9½ inches. The general color is light bluish gray, the back and wing linings reddish, the lower parts white, washed along the flanks with salmon pink. Females are paler than males. The nest is composed of sticks, lined with feathers and soft materials; and the eggs are salmon brown with darker, curiously scratched markings. A tropical relative of this exquisite and active bird is the fork-tailed flycatcher (*Milvulus*, or *Muscivora, tyrannus*), whose tail feathers are black. See Plates of FLYCATCHERS and EGGS OF SONG BIRDS.

SCITAMINA′LES (Neo-Lat., from Lat. *scitamenta*, dainties). An order of monocotyledons

comprising four families, which are regarded as the most advanced monocotyledons with the exception of the orchid alliance. These families include such well-known plants as bananas, gingers, and cannas, altogether comprising nearly 800 species, 500 of which are gingers.

SCITUATE, sĭt′ū-āt. A town in Providence Co., R. I., 12 miles west of Providence, on the Moswansicut River (Map: Rhode Island, B 2). It has some manufactures. Pop., 1900, 3361; 1910, 3493.

SCLATER, slā′tēr, PHILIP LUTLEY (1829–1913). An English zoölogist. He studied at Corpus Christi College, Oxford, was admitted a barrister of Lincoln's Inn, from 1859 to 1902 was secretary of the Zoölogical Society of London, and from 1866 until his death (with the exception of 12 years) was editor of the *Ibis*, a quarterly journal of ornithology. His writings include about 1200 memoirs on zoölogical topics and several extended works, such as the *Monograph of the Jacmars and Puff-Birds* (1882).

SCLERENCHYMA, sklē-rĕn′kĭ-mȧ. See HISTOLOGY.

SCLE′RODER′MA (Neo-Lat., from Gk. *σκληρός, sklēros*, hard + *δέρμα, derma*, skin). A rare skin disease characterized by large or small patches of induration, with stiffening of the skin, terminating in atrophy. In the later stages the indurated skin becomes hard, immovable, and bound down to the underlying tissues. The disease may last a lifetime, but it may be ameliorated or cured by baths, by massaging with oily substances, and by electricity.

SCLEROM′ETER. See HARDNESS, SCALE OF.

SCLERO′SIS (Neo-Lat., from Gk. *σκλήρωσις, sklērōsis*, induration, from *σκληρός, sklēros*, hard). A hardening, resulting from degenerative changes in which normal tissues are replaced by connective tissue, as in a scar; an induration. The hardening of the middle coat of an artery is termed arteriosclerosis (q.v.). Replacing of the normal tissue of the liver by contractile connective tissue is termed cirrhosis of the liver (q.v.). Degeneration and destruction of the tissue of the spinal cord or of the brain is termed sclerosis and is the essential lesion of several diseases, of which locomotor ataxia may be taken as a type.

SCLEROS′TOMA (Neo-Lat., from Gk. *σκληρός, sklēros*, hard + *στόμα, stoma*, mouth). A well-known genus of roundworms. One species (*Sclerostoma syngamus*) is of special interest, as being the cause of the disease in poultry known as the gapes (q.v.). Another important species, *Sclerostoma* (*Anchylostoma*) *duodenale*, or Old World hookworm, is tolerably common throughout northern Italy. It also occurs in India, Brazil, Egypt, the Antilles, Switzerland, and Belgium, and is the cause of the disease called miner's anæmia. See HOOKWORM DISEASE.

SCLOPIS DI SALERANO, sklō′pīs dē sä′lȧ-rä′nō, FEDERIGO, COUNT (1798–1878). An Italian jurist and statesman. He was born in Turin and was educated at the University of Turin. He entered the service of the Sardinian government in the Department of the Interior, rose to be a member of the Supreme Court, and in March, 1848, became Minister of Justice in the Balbo cabinet, going out of office, however, in July. In 1849 he became a member of the Senate, over which he presided from 1861 to 1864. In the latter year he was admitted to the Academy of Turin. He was nominated by the King of Italy to the Geneva tribunal for the arbitration of the Alabama claims (q.v.) and was president of the court. He was the author of *Storia dell' antica legislazione del Piemonte* (1833); *Storia della legislazione italiana* (1840–57); *Sull' autorità giudiziaria* (1842); *Le relazioni politiche tra la dinastia di Savoia ed il governo britannico dal 1240 al 1815* (1853).

SCLOT, BERNAT. See DESCLOT, BERNAT.

SCOGAN, skō′gan, HENRY. See SCOGGIN'S JESTS.

SCOGGIN'S JESTS. A collection of jests made as early as 1565, though the earliest extant edition bears the date 1626. The reputed author, Henry Scoggin, or Scogan, is said to have been a fool at the court of Edward IV and flourished from c.1361 to 1407. The full title of the collection runs: *The First and Best Parts of Scoggin's Jests. Full of Witty Mirth and Pleasant Shifts, done by him in France and other places: being a Preservative against Melancholy. Gathered by Andrew Boord, Doctor of Physicke.* Andrew Boorde (q.v.), the reputed collector, was a famous sixteenth-century wit, who, however, probably had nothing to do with the compilation of the so-called Scoggin's jests, which was made by some unknown hand from various sources for the bookseller. Similar collections bear the name of John Skelton (q.v.) and of Joseph Miller (q.v.). Consult *Old English Jest Books*, vol. ii (ed. by Hazlitt, London, 1864); and see JEST.

SCOKE. See POKE.

SCOLD'S BRIDLE. See BRANK.

SCOLECIDA, skŏ-lĕs′ĭ-dȧ (Neo-Lat. nom. pl., from Gk. *σκώληξ, skōlēx*, worm). A name, now obsolete, of a group of Annuloida or Vermes, comprising the Entozoa of Cuvier and also the free Turbellaria.

SCO′LIO′SIS. See SPINE, CURVATURE OF.

SCOL′LARD, CLINTON (1860–). An American poet and educator. He was born at Clinton, N. Y., the seat of Hamilton College, where he graduated in 1881. Afterward he studied at Harvard University and in Cambridge, England. He was professor of English literature at Hamilton College from 1888 to 1896. He was honored by membership in the National Institute of Arts and Letters. His verse, which is characterized by true poetic feeling and much of which reaches a high level, was published in the volumes: *Pictures in Song* (1884); *Old and New World Lyrics* (1888); *Giovo and Giulia, a Metrical Romance* (1892); *Songs of Sunrise Lands* (1892); *The Hills of Song* (1895); *Skenendoa* (1896); *A Boy's Book of Rhyme* (1896); *The Lyric Bough* (1904); *Odes and Elegies* (1905); *Eastersong* (1907); *Songs of a Syrian Lover* (1911); *Lyrics from a Library* (1913); *Poems* (1914); *The Vale of Shadows* and *Italy in Arms* (both 1915). *Under Summer Skies* (1892) and *On Sunny Shores* (1893) are prose. Consult J. B. Rittenhouse, *The Younger American Poets* (Boston, 1904).

SCOLYT′IDÆ. See AMBROSIA BEETLES.

SCOMBRIDÆ, skŏm′brĭ-dē (Neo-Lat. nom. pl., from Lat. *scomber*, from Gk. *σκόμβρος, skombros*, mackerel). A large and important family of spiny-rayed fishes, including mackerels, tunnies, and bonitos. Some species grow to a very large size—1500 pounds. They are migratory, traveling in schools, often in great numbers. The family contains about 60 species, most of which are excellent food fishes, and some have a great economic value. See MACKEREL; FISHERIES.

SCONE, skōōn *or* skōn. A parish in Perthshire, Scotland, on the Tay, 2 miles from Perth (Map: Scotland, E 3). Pop., 1901, 2362; 1911, 2389. It is first mentioned in the beginning of the tenth century as the royal city, when a council was held there in the reign of King Constantine II. A monastery was built at Scone about the same period, and there was located the famous stone on which the kings of the Scots were inaugurated and which was carried by Edward I of England to Westminster Abbey. An abbey was founded by Alexander I in 1115, in which the sovereigns continued to be inaugurated and crowned. The last coronation celebrated at Scone was that of Charles II on Jan. 1, 1651. The present palace, belonging to the Earl of Mansfield, was erected on the same site after 1800.

SCOPA'RIUS. See SPARTEINE.

SCO'PAS (Lat., from Gk. Σκόπας, *Skopas*). A Greek sculptor born at Paros. He is called the architect of the new temple of Athena Alea at Tegea, which replaced a temple burned in 395–394 B.C., and he was one of the sculptors of the Mausoleum (q.v.), completed about 350 B.C. Until recently the works of Scopas were known only through literary references. But the discovery in 1879 and 1900–01 of the fragments of the pediment sculptures at Tegea (q.v.), which include four heads (of Atalanta, Heracles, and two warriors), has afforded a basis for the analysis of the style of Scopas and rendered it possible to recognize copies of his work in such figures as the Meleager of the Vatican (much better represented in a statue in the Fogg Art Museum at Harvard University and a head in the Villa Medici), and the seated Mars formerly in the Villa Ludovisi. To him also seems to belong a type of Hercules, of which perhaps the best example is the bust from Genzano in the British Museum. To these may be added a fine female head from the south slope of the Acropolis and a torso of Æsculapius from the Piræus, both in the National Museum at Athens. All these works are characterized by the broad and rather short face (in marked contrast to the long oval of the Hermes of Praxiteles), the deep-set eye, and especially by intensity of expression. To produce this effect the work is concentrated on certain features such as eyes and mouth, while in the works of Praxiteles the whole surface is carefully finished. Consult: Adolf Furtwängler, *Masterpieces of Greek Sculpture* (Eng. trans. by Eugénie Sellers, London, 1895); E. A. Gardner, *Six Greek Sculptors* (ib., 1910); id., *A Handbook of Greek Sculpture* (ib., 1911); R. B. Richardson, *Greek Sculpture* (New York, 1911); H. H. Powers, *The Message of Greek Art* (ib., 1913).

SCOPOLAMINE, skō'pō-lăm'ĭn *or* skŏ-pŏl'ă-mĭn (from Neo-Lat. *Scopolia*, a genus of plants (named from G. A. Scopoli, 1723–88) + *amine*). The active principle of *Scopolia carniolica*, the alkaloid being extracted from the dried rhizome of the plant. Its therapeutic qualities are those of a nerve sedative, and it has a special action on the memory. It is used, in combination with morphine, as a hypnotic and is the drug chiefly concerned in producing the condition popularly known as twilight sleep (q.v.).

SCORAILLE DE ROUSSILLE, MABIE ANGÉLIQUE DE. See FONTANGES, M. A. DE SCORAILLE DE ROUSSILLE, DUCHESSE DE.

SCORBU'TUS. See SCURVY.

SCORE (AS. *scor*, score, twenty, from AS., OHG. *sceran*, Ger. *scheren*, Eng. *shear;* connected with Gk. κείρειν, *keirein*, to cut, Lat. *curtus*, short). In music, the arrangement of the various voices or instruments, employed in a composition, in such a manner that all tones which are to be sounded together are written vertically. Before the seventeenth century compositions were not generally printed in scores, but in part books, each book containing only one part or voice of a composition. (See PART BOOK.) In the case of organ music, however, an imperative need was felt at an early time to write all those tones which were to be struck together one above the other; hence the organ tablature. (See TABLATURE.) Hucbald (q.v.), who lived in the tenth century, wrote his works in scores. There seems to be little doubt that from the earliest times composers wrote their works originally in score. There are two noteworthy examples of early scores: one a printed score of madrigals composed by Cipriano de Rore and printed in 1577 by Gardano in Venice; the other an original manuscript where all four voices are written on one staff, the notes of the different voices being distinguished by different colors and forms.

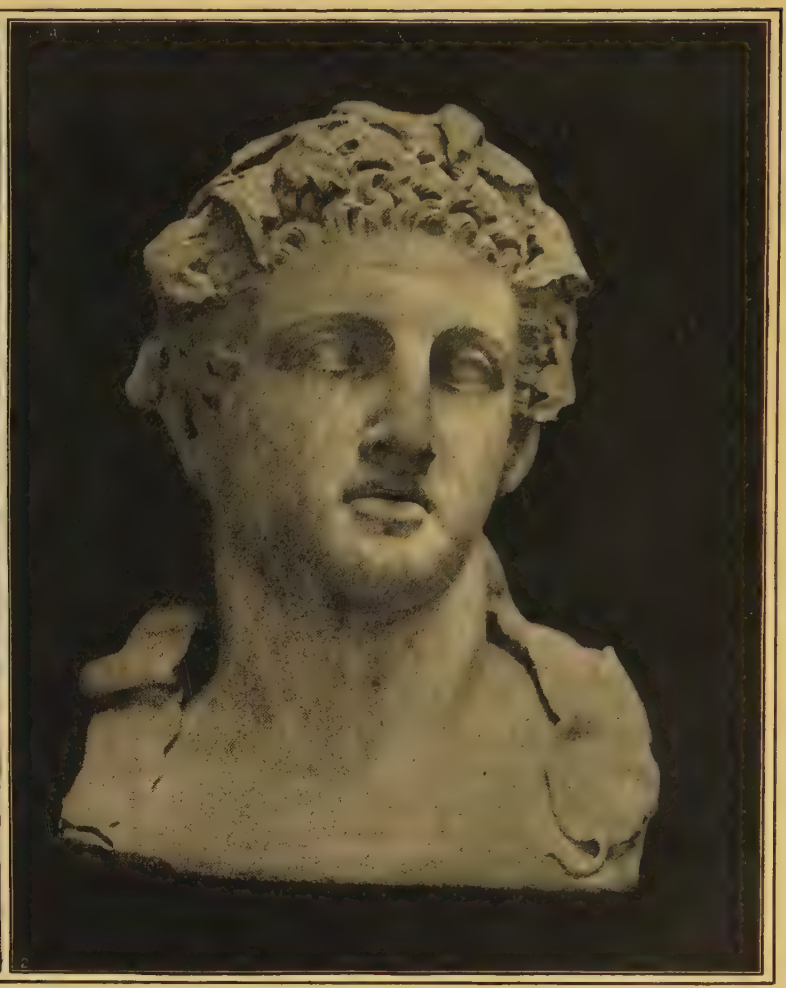
As to orchestral scores, it is probable that all music written for a combination of orchestral instruments was published only in score form. Some of the earliest specimens of such scores are those of De Beaujoyeaulx's *Ballet comique de la Royne* (Paris, 1582), Peri's *Eurydice* (Florence, 1600), Cavaliere's *Anima e corpo* (Rome, 1600), and Monteverde's *Orfeo* (Venice, 1609). (See ORCHESTRA.) The guiding principle at first was to place the highest instruments at the top and the lowest at the bottom of the page. But as the wood and brass instruments were gradually perfected and became parts of the orchestra, this principle could no longer be strictly followed. Hence a new plan was adopted. Instruments of the same group or family were kept together. If voices were employed with the orchestra, they were kept together; but for some time great confusion prevailed as to their position relative to the instruments. Bach generally wrote the instrumental parts above the voices and the organ parts below the voices. Handel followed the same principle very closely, but placed the celli and basses below the voices. Both masters wrote the brass instruments above the wood wind.

The score reader must keep in his mind a different grouping of instruments for every score; but even without this, score reading presents enough difficulties. Beethoven therefore established a certain fixed order in which he arranged his scores, so that the same instruments are always written in the same place. He adopted what was then known as the German system, i.e., the wood wind highest, next the brass, then instruments of percussion, and the strings lowest. The Italian system differed by placing violins and violas highest, then the wood and brass, the celli and basses lowest—a system not to be commended, because it separates the strings, which constitute the foundation of the orchestra. Although later masters, especially Berlioz, Liszt, Wagner, and Strauss, have introduced a great number of new instruments, they adhere in general to Beethoven's grouping.

As the military band has no strings, the scores written for such a combination of instruments naturally differ from full orchestral scores. But the principle of grouping remains the same.

For the convenience of musicians, and also to enable amateurs to study the great orchestral compositions by playing them in a reduced form

1. MARS, VILLA LUDOVISI, ROME



2. HERCULES FROM GENZANO BRITISH MUSEUM

upon the piano, all the full scores are arranged for this instrument. Such a reduced score of a purely instrumental composition is called pianoforte score, of a vocal work with orchestra a vocal score. In the latter the voices appear as in the full score, but the orchestra is reduced to the two staves of the piano. Such arrangements require much skill and experience.

There is also the compressed score, used for vocal composition, in which the four voices are compressed into two staves (soprano and alto on the treble, tenor and bass on the bass staff). A supplementary score is used when the number of voices or instruments is so large that there is not room enough for all staves on one page. Then some group is printed separately and added at the end of the full score.

Score Reading and Playing from Score. One of the principal requirements of a good orchestral conductor is the ability to read an orchestral score and to reproduce it at sight upon the piano. (See CONDUCTOR.) This ability can be obtained only through constant practice. The first requirement is thorough familiarity with the C clefs. (See MUSICAL NOTATION, *The Clefs.*) The beginning should be made with *a cappella* choruses for four mixed voices, where the tenor part (written in the treble clef) is to be transposed an octave lower. Then easy string quartets should be played (requiring the use of the alto clef in the violas). The next step would be to works of chamber music written for one transposing instrument, like the clarinet or horn. After a certain degree of skill has been attained in playing such scores the student is ready for works scored for a small orchestra. It is comparatively easy to proceed from this point to the reading of complicated scores. No one should attempt playing from score who has not a thorough knowledge of harmony as well as a fair knowledge of counterpoint. In reading a large score it is impossible to look at every individual note. A glance at the double basses, violins, and horns, as a rule, will suffice to establish the particular chord. The fundamental bass part and the melodic outline must be strictly preserved, but the intermediate harmonies must be recognized at a glance and distributed on the spur of the moment. On account of the transposing instruments, skill in transposition is essential. Consult H. Riemann, *Katechismus des Partiturspiels* (Leipzig, 1903).

SCOREL, skō'rĕl, JAN VAN (also SCHOREEL and SCHOORLE) (1495–1562). A Dutch historical and portrait painter, the first to bring the influence of the Italian Renaissance into Holland. He was born at Schoorl, near Alkmaar, studied first in Haarlem, then under Jacob Cornelisz at Amsterdam and Jan Mabuse in Utrecht, and finally became a pupil of Albert Dürer in Nuremberg. Subsequently he traveled to the Holy Land and about 1522 went to Rome, where he was made overseer of the Vatican Gallery by his countryman, Pope Adrian VI. On his return he entered the priesthood as a canon in Utrecht. His pictures are now rather scarce, as many of them were destroyed by the Dutch iconoclasts. His earliest authentic painting is an altarpiece in Obervellach (Carinthia). "Magdalen," in the Rijks-Museum at Amsterdam, "The Fall of Man," and "The Baptism of Christ," at Haarlem, are also attributed to him, but his best work was in portraiture, which he was among the first to introduce into Holland. Good examples are the groups of Crusaders in the galleries at Haarlem and Utrecht, and Agatha von Schonhoven, Doria Gallery, Rome. All his work shows the influence of Italian models.

SCORESBY, skōrz'bĭ, WILLIAM, JR. (1789–1857). An English Arctic explorer and physicist. He was born near Whitby, Yorkshire. When only 11 years of age the boy accompanied his father, a whaler, to Greenland and afterward he was his constant companion on his voyages. During the winter months he studied navigation, mathematics, natural history, chemistry, etc., at Edinburgh. After 1806 he began the study of the meteorology and natural history of the Arctic regions and attracted the attention of scientific men by his careful and accurate papers on these topics. In 1806, while chief officer on his father's ship *Resolution*, he reached lat. 81° 30′ N. in long. 19° E., the most northern point authentically known to have been attained up to that time. His father and he saw the unknown coasts of east Greenland in their voyages of 1817 and 1821. It was in 1822, however, that Scoresby made his most important voyage. Early in June he was near enough to Greenland to chart the coast from Cape Hold-with-Hope (discovered and named by Hudson in 1607 on the north side of the entrance of Franz Josef Fiord in lat. 73° 30′ N.) to Gale Hamke Bay, lat. 75° N., named after its Dutch discoverer in 1654. His surveys and discoveries completely changed the maps of the coast of east Greenland, reducing its longitudinal extent by nearly three-fourths. His explorations and recommendations led to the renewal by England of the search for the Northwest Passage. No other explorer, save Nordenskiöld, has so largely contributed to a scientific and accurate knowledge of the Arctic regions.

Although Scoresby entered the Church and was appointed curate of Bassingby in 1825, his scientific labors ended only with his life. He contributed largely to the knowledge of terrestrial magnetism, made a voyage to Australia in 1856 to obtain new data on this subject, wrote many papers for the Royal and other societies on this and other branches of science, and made valuable observations on the height of Atlantic waves during two visits to America. He was also much interested in social problems and especially in improving the condition of factory operatives. His Arctic books are *History and Description of the Arctic Regions* (1820) and *Journal of a Voyage to the Northern Whale Fishery, Including Researches and Discoveries on the Eastern Coast of Greenland* (1823). His *Journal of a Voyage to Australia for Magnetical Research* was published in 1859, after his death. Consult R. E. Scoresby-Jackson, *Life of William Scoresby* (London, 1861).

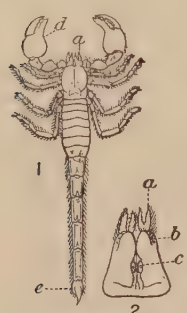
SCORPÆNIDÆ, skôr-pē'nĭ-dē (Neo-Lat. nom. pl., from Lat. *scorpæna*, from Gk. *σκόρπαινα*, *skorpaina*, sort of fish, from *σκορπίος*, *skorpios*, scorpion). A very large and important family of spiny-rayed fishes, the rockfishes (q.v.). The body is elongate, compressed, and bears ctenoid scales. The head is large and armed to a greater or less extent with ridges or spines. The mouth is usually large, the teeth villiform. The dorsal fin is long, the anterior portion spinous; the anal short, with 3 spines and 5 to 10 soft rays. Many of the species are viviparous, the young being when born about one-fourth of an inch long. They are nonmigratory fishes, inhabiting the rocky margins of all seas, especially the temperate Pacific. The family includes about 30

genera and 250 species, many of them of large size and all good as food fishes. Many of the species are reddish and are hence called rosefishes (q.v.).

SCOR'PENE. See SCORPION FISH.

SCOR'PIO (Lat., the scorpion). The eighth sign of the zodiac (q.v.), running from 210° to 240° on the ecliptic (q.v.). It is denoted by the symbol ♏. The chief ornament of the constellation Scorpio is Antares, a fiery-red star of the first magnitude, with a green companion of the seventh magnitude. ν Scorpii is a quadruple star, which was first recognized as a double star by C. Mayer in 1776, the third component being resolved by Mitchel in 1846 and the fourth by Burnham in 1874. Several *novæ* have appeared in this constellation, the most famous being the star of Hipparchus (in 134 B.C.) and one discovered by Auwers in 1860. There is also a fine globular cluster, Messier 80.

SCOR'PION (Lat. *scorpio*, from Gk. σκορπίος, *skorpios*, scorpion). One of the tailed arachnids of the order Scorpionida, natives of warm countries in both the Eastern and Western hemispheres. The body is divided into a short, compact, leg-bearing cephalothorax and a long segmented abdomen. The last five segments of the abdomen form a slender tail-like portion. The terminal segment is modified into a curved sharp sting provided with two pores from which the poison flows. The poison is supplied by two poison glands at the base of the segment. To the cephalothorax are attached six pairs of appendages. The first pair (mandibles) is short, the second pair (palpi) long, and both pairs bear pincers. Those of the palpi are very large and resemble lobster claws. The four succeeding pairs of appendages are true legs. The abdomen is without appendages save the second segment, which bears two comblike organs, the pectines, the function of which is not known. There are four spiracles or breathing pores on each side of the abdomen. There are from three to six pairs of eyes. The sexes differ in the broader pincers and longer abdomen of the male. They are viviparous, and the mother carries her young about with her for some time after they are born. They cling to all parts of her body by means of their pincers. Scorpions feed on spiders and large insects, which they seize with their claws and kill by their poisonous sting. They hide by day in crevices, under stones, or in dark holes and are largely nocturnal in their habits. They run with great swiftness and with the tail curved over the back. Some species may enter houses and hide in boots, shoes, or garments and, when disturbed, sting human beings. The sting is very painful, but rarely, if ever, fatal. The poison should be pressed or sucked out of the wound, and ammonia should be applied externally and taken internally. No scorpions occur in the United States north of Nebraska, but in the South about 20 species are known.



SCORPION.

1, full figure of *Scorpio afer;* 2, mouth parts enlarged; *a*, cheliceræ; *b*, lateral ocelli; *c*, central large ocelli; *d*, maxillary palpi: *e*, telson (the sting).

Scorpions are the most primitive of living arachnids, show very close resemblance to the king crab (q.v.), and occur as fossils in the Silurian rocks, but the early forms differ little from modern types. The word "scorpion" is used in combination in the common names of other closely related orders, such as the false scorpions and whip scorpions. (See ARACHNIDA.) The false scorpions (order Pseudoscorpiones) are small Arachnida which resemble the true scorpions, but lack the long jointed tail. The abdomen is ovate and broader than the cephalothorax, and there is no poison sting. The jaws are fitted for sucking, but the palpi bear large pincers as in the true scorpions. There are two pairs of spiracles and two or four eyes, although some forms are blind. The female lays eggs which she carries attached to the first segment of the abdomen. The false scorpions are swift runners, moving sidewise and backward with equal facility. They feed on mites, psocids, and other minute insects and are found in moss, under the bark of trees, or between the leaves of dusty books. *Chelifer cancroides* is common in storerooms in old houses. They are often found attached to other insects, especially to flies. The whip scorpions, or whiptails (order Pedipalpi), are arachnids with a long body, segmented thorax, and a long whiplike appendage at the tip of the abdomen. The forelegs have many tarsal joints and are elongated and whiplike. The mandibles are furnished with claws, and the palpi are very large and are armed with strong spines. The whip scorpions are tropical in their distribution. One species (*Thelyphonus giganteus*) is found in the southern United States, where it is known as the mule killer, vinaigrier, or vinegarone, the latter names derived from an acid secretion which has the odor of vinegar and which is ejected by the creature when disturbed or alarmed. Although very dangerous in appearance, it is perfectly harmless to man. It feeds upon insects during its whole life, the adults destroying large grasshoppers and beetles.

Consult: Kingsley, in *Standard Natural History* (Boston, 1884); E. Ray Lankester, "Limulus an Arachnid," in *Quarterly Journal Microscopical Science* (London, 1881); Cecil Warburton, "Scorpions," in *Cambridge Natural History*, vol. iv (New York, 1909); J. H. Comstock, *Manual for the Study of Insects* (8th ed., Ithaca, 1909).

SCORPION. A chameleon. See CHAMELEON, *American Chameleons.*

SCORPION FISH, or SCORPENE. A fish of the genus *Scorpæna*, typical of the Scorpænidæ (q.v.); specifically, the common market fish of southern California (*Scorpæna guttata*), which is about a foot long and has brown, mottled, rosy, olive, and other tints.

SCORPION FLY. Any one of the curious insects belonging to the order Mecoptera, which contains the single family Panorpidæ. Strictly speaking, the term "scorpion fly" should be restricted to the members of the typical genus *Panorpa*, which have the terminal segments of the abdomen elongate and very mobile, while the genital organs are curiously enlarged and modified. This tail-like structure is carried in a curved position over the back, somewhat after the manner of the true scorpions. The scorpion flies have four wings with many veins, and the head is prolonged to form a deflexed beak which is provided with palpi near the apex. The metamorphoses are complete. The larvæ are provided with legs and usually with numerous prolegs like the sawflies. The larvæ are carnivorous and live near the surface of the ground. They feed usu-

ally upon dead animals, including such soft-bodied insects as caterpillars and grubs. The representatives of the family in the United States are all contained in the genera *Panorpa*, *Bittacus*, and *Boreus*. The panorpas are very common insects in the midsummer in most parts of the United States. Some of them have spotted wings and are seen flying in the bright sunlight in places where tall herbage abounds. The genus *Boreus* is composed of wingless forms which look something like minute grasshoppers and occur in the winter upon snow in the Northern States.

SCOR'ZONE'RA (It., black bark). A rather large genus of plants of the family Compositæ, natives mostly of Europe and Asia. The common scorzonera or black salsify (*Scorzonera hispanica*), a native of southern Europe, has long been cultivated for its tapering black esculent roots about the thickness of a man's finger. The leaves are sometimes used to feed silkworms.

SCOT, or SCOTT, MICHAEL (c.1175–c.1234). A famous mediæval scholar, who probably belonged to a family on the Scottish border. He received his education at the universities of Oxford, Paris, Bologna, Palermo, and Toledo, and spent most of his later life at the court of the Emperor Frederick II in Sicily, where he was one of the most famous of the group of scholars collected around that enlightened monarch. He was in high favor with both Honorius III and Gregory IX, who gave him various benefices, probably in Italy. In 1230 he visited Oxford, taking with him works of Aristotle and various commentaries. Of his printed works, the best known are *Liber Physiognomiæ Magistri Michaelis Scoti* and *Mensa Philosophica*, translated into English and frequently printed under the title of *The Philosopher's Banquet*. In addition he made various translations of Aristotle's works and the Arabic commentaries. He also wrote works on astronomy and alchemy. As was so often the case in the Middle Ages with famous scholars, Michael Scot became known soon after his death as a magician, and as such he has figured extensively in literature. Sir Walter Scott has caused the action of his *Lay of the Last Minstrel* to centre about the traditional grave of Michael at Melrose Abbey. Consult J. Wood Brown, *Life and Legend of Michael Scot* (Edinburgh, 1897).

SCOT, REGINALD. See SCOTT, REGINALD.

SCOTCH. See also SCOTTISH.

SCOTCH DEERHOUND. See GREYHOUND.

SCOTCH FANCY CANARY. See CANARY.

SCOTCH LAW. The most ancient records of this body of law indicate that its fundamental principles and institutions are very similar to those of Anglo-Saxon England. At a very early period, however, the jurisprudence of Scotland began to diverge from that of its southern neighbor. In England a system of national courts was established as early as the thirteenth century, whose decisions were reported and formed precedents for future cases. Not until the middle of the sixteenth century, however, did Scotland secure anything in the nature of a complete judicial system. A century earlier, it is true, a Court of Session had been established, consisting of certain persons named by the King out of the three estates of Parliament and receiving its name from the fact that it was to hold a certain number of sessions annually at places to be named by the King. It was a court of first instance, in the main, and no appeal lay from its decisions. Its judges were so negligent in the performance of their duties, however, that it was abolished in 1532 and a new Court of Session and College of Justice instituted. The decisions of this court form a series of law reports, known as *Scotch Court of Session Cases*, covering the years 1621 to date. Until the middle of the sixteenth century, therefore, there was no opportunity for the development of a national system of Scotch law. Nearly all litigation was conducted in local tribunals, of which the most important was the Sheriff's Court (q.v.). In these, local usages and customs were enforced, but a common law of the realm was not and could not be evolved. "A private transcript of Glanvil's *Treatise on the Laws of England*, altered so as to adapt it to the notorious practice in Scotland, and feigned to have been compiled by order of David I," and known as *Regiam Majestatem Scotiæ Veteres Leges et Constitutiones*, appears to have been received by the Scotch Parliament and judges as a correct statement of their written law down to the opening of the sixteenth century. After the establishment of the College of Justice the unwritten law of Scotland developed rapidly, although along lines quite different from those followed in England. The tribunal itself had been modeled not after any English court, but after the constitution of the Parlement of Paris. Its judges consisted of seven churchmen, seven laymen, and a president. After the Reformation clergymen were received as judges until 1640, but since then only duly qualified advocates are appointed to this court and their selection is a prerogative of the sovereign. The system of legal rules administered by this tribunal was not so much that of England as that of Rome. Scotch lawyers were educated in France or Italy or Holland, where the Roman civil law prevailed. Scotch judges had no such antipathy to that law, either in its original form or in the modified form in the canon law, as characterized the judges of England. As a result modern Scotch law has a very large infusion of the principles of the Roman law. Even at present admission to the Faculty of Advocates is conditioned upon a successful examination in the Roman law, and no one not an advocate is qualified for a judgeship in the Court of Session unless he has passed such an examination.

Since the union of Scotland and England the tendency of legislation has been towards the assimilation of the legal systems of the two countries. The public acts relating to Scotland (1707 to 1907) have been published in *The Scots Statutes Revised* (11 vols., Edinburgh). Lord Cockburn declared in 1846 that "the improvements introduced or recommended in England by law reformers amount, in a really surprising number of instances, to little else than an approximation to the law of Scotland." While this is true, it is also to be said that the most recent legislation has modified many of the Scotch rules and brought them into accord with those of English common law. Notwithstanding the process of assimilation which has been going on for two centuries, nevertheless the two legal systems present many striking differences still. Some of the most important are the following:

The nomenclature is so different that a learned writer upon the topic has declared that an interpreter is generally required in case of consultations between English and Scotch lawyers. A glossary of technical terms of common occur-

rence in Scotch law is contained in Kinnear, *Digest of House of Lords Cases Decided on Appeal from Scotland* (Edinburgh, 1865).

In matter of substance the two legal systems are quite as much at variance as in terminology. English law divides property into real estate and personalty. Scotch law classifies it as heritable or movable. Heritable property includes not only lands and all rights of or affecting lands, but various forms of personal property such as certain bonds; also chattels which the owner directs shall vest in his heirs. Movables are all kinds of property which go not to the heir but to the executor. Again, English law requires that every contract not under seal must have a consideration, while "in Scotland it is not essential to the validity of an obligation that it should be granted for a valuable consideration, or, indeed, for any consideration, an obligation undertaken deliberately, though gratuitously, being binding." In English law obligations are divided into those of contract (q.v.) and those in tort (q.v.). Scotch law classifies them as contracts (subdividing these in accordance with the Roman law into real and consensual), quasi contracts, delicts, and quasi delicts. Under the head of quasi contracts it places certain obligations not so classed by the Roman law. Delict includes those torts of the English law which are also criminal offenses; while quasi delict includes torts of negligence or imprudence. Consult: J. Paterson, *A Compendium of English and Scotch Law* (2d ed., Edinburgh, 1865); J. Lorimer, *A Handbook of the Law of Scotland* (6th ed., ib., 1894); MacKenzie, *Studies of Roman Law* (7th ed., by John Kirkpatrick, London, 1898); J. W. Brodie-Innes, *Comparative Principles of the Laws of England and Scotland* (Edinburgh, 1903); John Erskine, *Principles of the Law of Scotland* (21st ed., ib., 1911).

SCOTCH MUSIC. The music of Scotland is of the same general character as that of Ireland and Wales. (See CELTIC MUSIC.) The national melodies are generally considered to be of great antiquity. No musical manuscript of Scotch airs is now known to exist of an older date than 1627, and we have no knowledge when and by whom the early Scotch melodies were composed. Their disappearance seems to have been due first to the strong measures resorted to, about 1530, by both civil and ecclesiastical authorities, to put down all ballads reflecting on the Roman Catholic hierarchy, and afterward to the ill will shown by the dominant Presbyterians towards worldly amusements. The most valuable existing early collection of Scotch melodies is the Skene manuscript, in the Advocates' Library, noted down by Sir John Skene of Hallyards about the year 1630. It contains a number of native airs, mixed with some foreign dance tunes —upward of 100 in all. Many of the Scotch melodies exhibit beauties which the changes these airs have undergone have only tended to destroy.

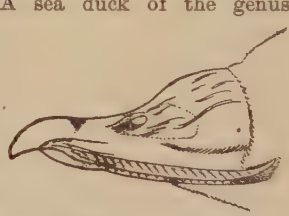
Among the peculiarities which give character to the music of Scotland the most prominent is the employment of the pentatonic scale (q.v.). Another characteristic is the substitution of the descending for the ascending sixth and seventh in the minor scale, as at the beginning of the air called *Adew, Dundee*, in the Skene manuscript. A very prevalent course of modulation is an alternation between the major key and its relative minor, the melody thus ever keeping true to the diatonic scale of the principal key, without the introduction of accidentals. The closing note is by no means necessarily the keynote, a peculiarity especially remarkable in the Highland airs, which if in a major key most frequently terminate on the second, if in a minor on the seventh. Closes are also to be found on the third, fifth, and sixth. Among the printed collections of Scotch melodies with words the most important is George Thomson's collection, with symphonies and accompaniments by Pleyel, Kozeluch, Haydn, Beethoven, Bishop, Hummel, and Weber (vols. i–iv, 1793–1805; vol. v, 1826; vol. vi, 1841), one distinguishing feature of which was the appearance of Burns's words conjoined with the old melodies of the country. Consult William Stenhouse, *Illustrations of the Lyric Poetry and Music of Scotland* (Edinburgh, 1853), and James Ballantine, "Historical Epitome of Scottish Songs," in Fulcher, *Lays and Lyrics of Scotland* (Glasgow, 1870). See BAGPIPE; PIBROCH.

SCOTCH TERRIER. See TERRIER, and Plate of DOGS.

SCOTCH TOPAZ. See CAIRNGORM.

SCOTCH VERDICT. The verdict of "not proven" which the jury in a criminal trial in Scotland are permitted to find in certain cases. The defendant cannot be again tried on the same charge. See GUILT, GUILTY; VERDICT.

SCO'TER (from Icel. *skoti*, shooter, from *skjōta*, OHG. *sciozan*, Ger. *schiessen*, AS. *scēotan*, Eng. *shoot;* ultimately connected with Skt. *skand*, to leap). A sea duck of the genus *Oidemia*, of which there are several species, with tumid or gibbous bill and no frontal processes; the tail has 14 or 16 feathers. The male is black, sometimes with white on head and wings; the female sooty brown. The largest American species is the white-winged scoter (*Oidemia deglandi*), which is 22 inches long and is very similar to the Old World scoter (*Oidemia fusca*). The surf scoter (*Oidemia perspicillata*) is a trifle smaller and has no white on the wings. The American black scoter (*Oidemia americana*) is still smaller (19 inches) and has no white on either head or wings. It is very similar to the European *Oidemia nigra*. These three American scoters are abundant in winter off the coast of New England and the Middle States. They feed on mussels and other mollusks and are considered poor eating. All breed in high northern latitudes and lay from 5 to 10 eggs in nests on the ground.



BILL OF A SCOTER.

SCOTIA, skō'shâ. A village in Schenectady Co., N. Y., adjoining Schenectady on the east, on the Mohawk River, and on the Boston and Maine Railroad. It is essentially a residential suburb of the larger city, but has a foundry and a broom factory. Pop., 1910, 2957.

SCOTIA. See BASE; MOLDING.

SCO'TIST. A follower of Duns Scotus (q.v.) in philosophy or theology. See SCHOLASTICISM.

SCOT'LAND. A constituent member of the United Kingdom of Great Britain and Ireland, including the three outlying groups of islands, the Hebrides to the west and the Orkney and Shetland islands to the northeast. Scotland is bounded by the Irish Sea, North Channel, Atlan-

ORKNEY AND SHETLAND ISLANDS
SCALE OF MILES
0 20 40 60
SHETLAND
ORKNEY
CAITHNESS
Cape Wrath
Butt of Lewis
Duncansbay Hd.
John O'Groats Ho.
Dunnet Hd.
Brims Ness
Noss Hd.
Sinclairs Bay
Wick
Pulteneytown
Latheron
Berriedale
Helmsdale
Port Gower
Golspie
Dunrobin Castle
Brora
Rogart
Lairg
Loch Shin
Ben Armine
Ben Klibreck
Ben Hope
Ben Loyal
Ben Klibreck
Ben Griam
Ben Wyvis
Ben More
Ben Derg
Ben Eay
Ben Nevis
Ben Alder
Ben Macdhui
Ben Avon
Ben Muich Dhui
Ben Aan
Ben Lawers
Ben Ledi
Ben Venue
Ben Lomond
Ben More
Ben Cruachan
Ben Lui
Ben Vorlich
Ben Chonzie
Ben Voirlich
Ben Ime
Ben Arthur
Ben Vane
Ben Donich
Ben Cleuch

SCOTLAND
ATLANTIC OCEAN
NORTH SEA
IRISH SEA
SOLWAY FIRTH
FIRTH OF FORTH
EDINBURGH AND VICINITY
SCALE OF STATUTE MILES
0 5 10 15 20 25 35 40 45
SCALE OF KILOMETERS
0 10 20 30 40 50 60
Important towns are shown in heavy face type
Important Railways
Canals
County Seats are underlined thus: Perth
Longitude 5° West from Greenwich
Glasgow
Edinburgh
Dundee
Aberdeen
Perth
Stirling
Dumfries
Kilmarnock
Ayr
Greenock
Paisley
Renfrew
Hamilton
Motherwell
Coatbridge
Airdrie
Falkirk
Dunfermline
Kirkcaldy
Leith
Portobello
Musselburgh
Haddington
Dunbar
North Berwick
Berwick
Coldstream
Kelso
Melrose
Hawick
Jedburgh
Selkirk
Peebles
Galashiels
Innerleithen
Moffat
Lockerbie
Annan
Dumfries
Kirkcudbright
Castle Douglas
Dalbeattie
Newton Stewart
Wigtown
Whithorn
Stranraer
Portpatrick
Girvan
Ayr
Troon
Irvine
Saltcoats
Largs
Rothesay
Campbeltown
Oban
Fort William
Inverness
Aberfeldy
Blairgowrie
Arbroath
Montrose
Carlisle
Gretna
Longtown
Workington
Maryport
Whitehaven
Belfast
Bangor
Donaghadee
Newtownards
Larne
Carrickfergus
Ballycastle
Ballycastle Bay
Rathlin I.
Fair Head
Mull of Kintyre
Mull of Galloway
Ailsa Craig
Sanda I.
Pladda I.
Arran
Bute
Islay
Jura
Colonsay
Oronsay
Mull
Iona
Tiree
Skye
Lewis
Harris
North Uist
South Uist
Barra
Benbecula
Rum
Eigg
Canna
Coll
Skerryvore
Dubh Artach
Barra Head
Flannan Is.
Sula Sgeir
North Rona
Sule Skerry
Hoy
Orkney Is.
Shetland Is.
Fair Isle
Muckle Flugga
Out Stack
Unst
Yell
Fetlar
Whalsay
Bressay
Lerwick
Scalloway
Kirkwall
Stromness
Scapa Flow
Pentland Firth
John o' Groats
Duncansby Head
Dunnet Head
Cape Wrath
Kyle of Lochalsh
Kyle of Tongue
Loch Ness
Loch Lomond
Loch Awe
Loch Tay
Loch Rannoch
Loch Katrine
Loch Lubnaig
Loch Earn
Loch Leven
Loch Fleet
Loch Ryan
Loch Indaal
Loch Gruinart
Loch Tarbert
Loch Fyne
Loch Long
Loch Goil
Loch Striven
Loch Riddon
Loch Etive
Loch Creran
Loch Linnhe
Loch Sunart
Loch Shiel
Loch Eil
Loch Arkaig
Loch Lochy
Loch Oich
Loch Garry
Loch Quoich
Loch Hourn
Loch Alsh
Loch Carron
Loch Torridon
Loch Maree
Loch Broom
Loch Inver
Loch Assynt
Loch Shin
Loch Naver
Loch Eriboll
Loch Erisort
Loch Seaforth
Loch Roag
Loch Tarbert
Loch Boisdale
Loch Skipport
Loch Maddy
Loch Scavaig
Loch Coruisk
Loch Portree
Loch Snizort
Loch Dunvegan
Loch Bracadale
Loch Harport
Loch Sligachan
Loch Leathan
Loch Druidibeg
Loch Bee
Loch Boisdale
Loch Eynort
Loch Uskavagh
Loch Aline
Loch Sunart
Loch Moidart
Loch Shiel
Loch Eil
Loch Arkaig
Loch Lochy
Loch Oich
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Loch Dunvegan
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Loch Harport
Loch Sligachan
Loch Leathan
Loch Druidibeg
Loch Bee
Loch Boisdale
Loch Eynort
Loch Uskavagh

tic Ocean, and the North Sea on all sides except a comparatively short stretch on the southeast where it is contiguous to England. The whole is included between lat. 54° 38′ and 60° 51′ N., the mainland terminating in lat. 58° 41′ N. The greatest extent of the mainland from Dunnet Head in the northeast to the Mull of Galloway in the southwest is 288 miles, and its breadth varies from 25 to 146 miles. The total area of Scotland, including the islands, is 30,405 square miles. A general discussion of the topographical, climatic, biological, and geological features of Scotland, together with those of England and Wales, is given under the title UNITED KINGDOM, reference to which is made also for each of the headings below.

Perhaps the most striking general feature of Scotland is its irregularity in outline. Though much smaller than England in area, it has a longer coast line, about 2300 miles, which gives a proportion of 1 mile to every 13 square miles of area. Few places lie 40 miles from the sea. The east coast is indented by two large arms of the sea, which almost cut the country into three sections, while the west coast is dissected by numerous fiords or firths, which have converted many headlands into islands. Prominent among the firths are the Firth of Forth on the east, Moray Firth on the northeast, the Firth of Lorne and the Firth of Clyde on the west, and Solway Firth on the southwest border. Scotland differs from England topographically in that the greater part of its surface is mountainous, only the comparatively small south-central portion being lowland. The country may be divided into three physiographic divisions: the Highlands, the Lowlands, and the Uplands. The Highlands lie north of the Plain of Strathmore, are especially rugged in the west, and are divided by the Caledonian Canal. South of this line the Highlands are almost exclusively mountainous, characterized by the Grampian Hills and containing Ben Nevis, at the head of the Firth of Lorne, the highest mountain in Great Britain (4406 feet). North Scotland—the northwestern Highlands—the poorest part of the country, is an upland of swamp, moors, and bald, barren features. The highest peak in this region is Ben Dearg (3550 feet). The scenery here is highly picturesque and inspiring, being varied by castled elevations, lakes, valleys, glens, rivers, cascades, and rocky coasts, but the land can support only a sparse population. The Lowlands lie between the Firths of Forth and Clyde and resemble fertile England, containing a dense population and large industries. The Plain of Strathmore, which is a continuation of the Lowlands to the north and the most extensive cultivated section in Scotland, is somewhat shut off by the Ochil and Sidlaw hills. The Uplands in the extreme south are regions of hills, embracing fertile valleys. The best-known range here is the Cheviot Hills, on the English border. The highest peaks in south Scotland have an elevation of about 2700 feet. The rivers and lakes of Scotland are described under UNITED KINGDOM. Geologically Scotland is more thoroughly of ancient formation than England. In both the northern and southern highland regions little but Archean gneisses and Lower Paleozoic metamorphic rocks remains, but in the central depression a large Carboniferous area containing rich coal fields still survives the long ages of denudation. Igneous rocks of all ages are also more common than in England.

Mining. The production of coal is rapidly increasing; in 1913 it amounted to 42,456,516 tons, of which 17,486,267 tons were mined in the County of Lanark. Shale is procured in the Lowlands; the output for 1912 amounted to 3,184,000 tons, which would yield about 2,000,000 United States barrels of shale oil. A steady and increasing demand is assured by the substitution of liquid fuel for coal in the British navy. Iron ore is exploited, Ayrshire, Lanark, and Renfrew counties producing about four-fifths of the Scottish output. The total amount of iron ore mined in 1913 was about 725,000 tons, or less than one-twentieth of the entire production of the United Kingdom. Other mineral productions of some importance are granite, fire clay, limestone, slate, and lead ore. The total value of mineral products in 1913 was £22,436,444.

Fisheries. The value of the 7,828,350 hundredweight (112 pounds each) of fish taken in the calendar year 1913 was £3,723,357, the largest in the history of the industry (exclusive of shellfish). While there has been some decrease in net and line fishing, there was a very large increase in the amount of the catch by trawling. Sailing boats were in 1913 being rapidly superseded by steam or motor-power boats. In 1913, 38,262 men were engaged on 8991 fishing vessels. The total number of persons employed in the fisheries and the industries subsidiary thereto was 90,710. Considerably over one-half of the total catch is herring, the next most important varieties being haddock and cod. The fishing interest of the east coast is largely concentrated in Aberdeen.

Agriculture and Stock Raising. Owing to the extensive mountainous area, the development of agriculture is subject to very serious limitations. The cultivation of the soil is largely confined to the Lowlands. The area under crops and in pasture increased from an average of 4,560,825 acres for the period 1871–75 to 4,798,000 in 1913, the increase being almost wholly in the permanent pasture land and in rotation grasses. Over three-fourths of the area devoted to cereals is in oats, the yield of that crop in 1913 being 36,012,856 bushels. Barley is the only other important cereal crop, the yield in 1913 amounting to 7,365,828 bushels. Much less attention is given to wheat than formerly. Green crops are extensively grown, but the total acreage of these has been decreasing. Considerably over two-thirds was in turnips and swedes, which hold there a place as stock foods somewhat similar to that held by corn in the United States. The yield of turnips and swedes in 1913 was 7,335,857 long tons. Potatoes are also an important crop, which in 1913 amounted to 970,805 long tons. The area in clover, sainfoin, and grasses under rotation in 1913 yielded a crop of 893,147 long tons. A highly intensive system of cultivation is followed, and an exceptional yield of all crops is secured. The size of farm holdings and the system of tenure are much the same as for England. (See UNITED KINGDOM, *Agriculture.*) Stock raising is relatively very important. Extensive areas in the mountain regions are utilized for grazing. The country has long been noted for its sheep. Some of the best-known breeds, such as the Cheviots, are natives of Scotland. The total number of sheep in 1912 was 7,004,367. In the same year the cattle numbered 1,184,376. Among the well-known native breeds of cattle are the Ayrshire, Galloway, Polled Angus, and Jersey. The Clydesdale horse is one of the best-known breeds of

draft horses, while the Shetland ponies enjoy an equal distinction among ponies. In 1912 the horses numbered 205,267. But little attention is given to swine, which numbered only 159,127.

Manufactures. In but few countries is there so large a per cent of the population engaged in manufactures as in Scotland—in 1901, 26.77 per cent of the population being thus engaged, and in 1907, according to the returns made under the Census of Production Act, the number of persons employed, excluding outworkers, was 885,403. The history of the development of industry has been in its main lines quite similar to its course in England. Scotland shares with that country the advantages of climate, of commerce, and of mineral wealth and has contributed a goodly portion of the inventive genius, thrift, and business enterprise that have given Great Britain its high industrial rank. There are three groups of branches of manufacturing that have attained special prominence, viz., textiles, liquors, and iron and steel. Scotland, like the rest of the United Kingdom, shows a decline in the number of persons employed in the textile factories and an increase of those employed in the non-textile factories. In 1907 the number employed in the textile factories was 175,876, and in all other factories 709,527. The output of the textile factories was valued at £38,160,000. Among the textiles woolens, linens, and cottons are all important. Although Scottish woolens have been manufactured for centuries, they did not become prominent until the period of the revolution in the industry brought about by improved machinery in the early part of the nineteenth century. The woolens manufactured in the district of the Tweed are famous, and their production has become important in a large number of towns. Other varieties that have become well known are tartans, plaids, and shawls. In 1907 there were 27,865 persons employed in the woolen and worsted trades, with cost of materials amounting to £4,341,000 and an output valued at £6,312,000. The manufacture of linen had acquired large proportions as early as the seventeenth century, notwithstanding the attempts of the English to hinder its development. The industry profited much from the union with England and grew rapidly during the eighteenth century. In 1798 the value of the linen manufactures was estimated at £850,405. The greatest development in the industry was attained about 1867, when 77,195 persons were employed in 197 factories. The linen industry is widely distributed. In 1907 there were 90 factories and workshops and 69,608 persons employed in the jute, hemp, and linen trades. The manufacture of cotton goods developed very rapidly in the latter part of the eighteenth century and the early part of the nineteenth. In 1861 there were 163 factories employing 31,237 persons. Little progress has been made since that period, and in 1907 there were 14,633 persons employed in cotton factories. Most of the cotton factories are located in Glasgow or its vicinity. In late years the weaving of lace and the manufacture of silks have grown into industries of some importance.

The production of whisky in 1904 was 28,185,235 gallons, being considerably more than half the product for the United Kingdom. In 1907 23,598,000 proof gallons of spirits were produced. Scotland manufactures only a small part of the beer made in the United Kingdom, the output in 1907 being 1,820,000 barrels. Iron and coal mining began in 1760, and by the middle of the nineteenth century it employed 13,296 persons. In 1900, 1,156,885 tons of pig iron were produced, which was about one-seventh of the total for the United Kingdom. In 1913 the production was 1,377,747 tons. Scotland has become widely known for its shipbuilding, the Clyde being the largest shipbuilding centre in the world. The vessels of the Cunard Line are built chiefly in the Clyde shipyards. There are also a number of other shipbuilding centres, but of much less importance. In 1913 Scottish builders produced 505 vessels, aggregating 809,711 tons. Of this the Clyde produced 370 vessels, whose total tonnage was 756,976. There is, in addition to these, a large variety of less important industries, such as the manufacture of chemicals, pottery, confectionery, preserves, etc.

Transportation and Commerce. The railroad mileage increased from 2999 in 1884 to 3815 in 1913. The Caledonian Canal, connecting Moray Firth with Loch Linnhe and completed in 1847, is now used mainly for purposes of local traffic. Some of the canals of the Lowland district have been superseded by railroads. The course of the Clyde River has been greatly improved, until ocean vessels can reach the city of Glasgow (q.v.). This city is the principal port of Scotland. Leith is the next most important port, followed at a distance by Dundee, Grangemouth, Greenock, and Aberdeen (qq.v.). The value of imports into Scotland in the foreign and colonial trade increased from £8,921,108 in 1851 to £31,012,750 in 1874 and to £52,207,955 in 1912. The value of the exports leaving Scottish ports increased from £5,016,116 in 1851 to £17,912,932 in 1874 and to £52,415,692 in 1912. A considerable export trade not represented in these figures passes through the English ports. See UNITED KINGDOM, *Commerce*.

Finance. Scotland is subject to the same fiscal system as are the other members of the United Kingdom, a discussion of which will be found under UNITED KINGDOM, *Finance*. For the fiscal year ending March 31, 1913, the amount contributed by Scotland to the revenue was £19,950,000. The largest item was the excise tax, productive of £8,870,000, followed by the income tax, £3,605,000; estate, etc., duties, £3,193,000; customs, £2,659,000; stamps, £619,000; land tax and house duty, £162,000. The nontax revenue, chiefly from postal, telegraph, and telephone services, amounted to £2,777,000.

For banks, government, and charitable and penal institutions, see UNITED KINGDOM.

Population. The population of Scotland at the time of the Union in 1707 was estimated at 1,000,000. The first official census taken of the population in 1801 showed the inhabitants to number 1,608,420. By the middle of the century (1851) it had further increased to 2,888,742, in 1891 to 4,025,647, in 1901 to 4,472,103, and in 1911 to 4,760,904. In the last of these years Scotland contained 10.5 per cent of the total population of the United Kingdom. The density per square mile in 1911 was 160. The population, however, is very unevenly distributed, being quite sparse over the large Highland area, while the Lowlands, viz., the Glasgow-Edinburgh region, is one of the most densely populated districts in Great Britain. Between 1901 and 1911 the town districts—places having 1000 inhabitants and over—increased in population from 3,367,280 to 3,591,276, or 75.4 per cent of the total, while the rural districts increased from 1,104,720 to 1,169,628, or 24.6 per cent of the

total. The following table shows the growth of the larger cities.

CITIES	1861	1901	1911
Glasgow	394,846	775,594	784,496
Edinburgh	169,121	317,459	320,318
Dundee	90,417	162,982	165,004
Aberdeen	73,805	153,503	163,891

The following table gives the civil counties of Scotland, their area and population.

CIVIL COUNTIES	Area in sq. miles	Population	
		1901	1911
Shetland	551	28,166	27,911
Orkney	376	28,699	25,897
Caithness	686	33,870	32,010
Sutherland	2,028	21,440	20,179
Nairn	162	9,291	9,319
Elgin	477	44,800	43,427
Banff	630	61,488	61,402
Aberdeen	1,972	304,439	312,177
Kincardine	381	40,923	41,008
Ross and Cromarty	3,089	76,450	77,364
Inverness	4,211	90,104	87,272
Forfar	874	284,082	281,417
Perth	2,494	123,283	124,342
Fife	504	218,840	267,739
Kinross	82	6,981	7,527
Clackmannan	55	32,029	31,121
Stirling	451	142,291	160,991
Dumbarton	246	113,865	139,831
Argyll	3,110	73,642	70,902
Bute	218	18,787	18,186
Renfrew	240	268,980	314,552
Ayr	1,132	254,468	268,337
Lanark	879	1,339,327	1,447,034
Linlithgow	120	65,708	80,155
Edinburgh	366	488,796	507,666
Haddington	267	38,665	43,254
Berwick	457	30,824	29,643
Peebles	348	15,066	15,258
Selkirk	267	23,356	24,601
Roxburgh	666	48,804	47,192
Dumfries	1,072	72,571	72,825
Kirkcudbright	899	39,383	38,367
Wigtown	487	32,685	31,998
Total	29,796	4,472,103	4,760,904

The population of Scotland contains but a small number of non-Scots, amounting in 1911 to only 8.3 per cent of the total. Considerably over half of these were Irish, and the majority of the remainder were English. The foreign element amounted to only 0.52 per cent of the total population. In the decade 1901–11, 546,271 of the Scottish element left the United Kingdom for places out of Europe. Many of the Irish and the other non-Scottish elements residing in the country also have left for other lands. In 1911 the males numbered 2,308,839 and the females 2,452,065. In 1914 the births numbered 123,923, the deaths 73,548. The numbers engaged in occupations according to the returns of 1911 were classified as follows: professional, 141,134; domestic, 170,749; commercial, 111,143; agricultural and fishing, 780,867; industrial, 613,397; and the remainder or unproductive class, 2,572,929.

Religion. Scotland is the stronghold of Presbyterianism, and the mass of the population belong to that faith. The established branch of the Presbyterian church includes about one-half of the Protestant church population. In 1913 the parishes of this church numbered 1445, the congregations 1693, and the membership about 714,000. In 1900 the two branches—the Free Church of Scotland and the United Presbyterian Church of Scotland—were united under the name of the United Free Church of Scotland. This church had, in 1913, 1535 congregations and 33 preaching stations, with 507,000 members, besides adherents. There are a number of other nonconforming bodies, but all of them small. The Anglican (Episcopal) church in 1913 had 427 congregations and 55,000 communicants. The Roman Catholic population was estimated in 1913 at about 520,000; it consists mainly of the Irish element.

Education. The supremacy of Scotland over the other parts of the British Isles in elementary and secondary education is generally admitted. In remarkable contrast with England the country is distinguished for having early made public provision for instruction, and the religious controversies did not prevent the development of a homogeneous system. An Act passed in 1696 obligated the landowners to the support of schools, and they with the ministers of the parishes had charge of the administration of the system. An educational committee reported in 1829 that their schools were open freely to Roman Catholics and that the teachers were directed not to press on them any instruction to which their parents or priests might object. Small parliamentary grants to education began between 1830 and 1840. After 1861 it was only required of the teachers that they should not teach opinions opposed to the divine authority of the Scriptures or to the doctrine of the Shorter Catechism. By the Elementary Education Act of 1872 the Scottish Education Department was instituted and the board system was established, in accordance with which a school board elected in every parish and burgh every three years has charge of both elementary and secondary education. School boards have the power of prescribing religious instruction, but the time of giving it must be such that children absenting themselves will not miss any of the secular instruction. Since 1891 instruction has been free for children from 3 to 15 years of age and compulsory between the ages of 5 and 14, with conditional exemption after 12. The instruction given in the parish schools has been mainly elementary, and secondary instruction was provided by the burgh schools and the academies. Unlike England, private boarding schools have never been widely patronized in Scotland. Burgh schools were established prior to the Reformation; they were regulated by the burgh authorities and open to the general community, but there was never any provision by national enactment for their organization or financial support. The desire for more modern or practical courses of instruction resulted about the middle of the eighteenth century in the establishment of academies. However, the opportunities to receive a university preparation were always, and still remain, in a measure inadequate, necessitating the assumption of that work by the universities themselves. A parliamentary Act was passed in 1887 making technical education possible. In 1913, of the 3370 schools in receipt of grants, 3030 were public schools with an average attendance of 651,864 pupils; 224 Roman Catholic, with an average attendance of 87,158; and 116 others, with an average attendance of 14,884.

In proportion to population Scotland has a larger number of universities and a much larger attendance than has England. The universities are St. Andrews, founded in 1411; Glasgow,

1450; Aberdeen, 1494; and Edinburgh, 1582. The Scottish universities contrast strikingly with the older English universities in that the expense incurred in taking the course is much smaller in the former. Governmental financial support has never been very liberally extended, but has increased in recent years, which, together with the Carnegie gifts, of which the annual income is £500,000, has placed them upon a much better financial footing than ever before. Women are admitted to the universities under the same conditions as are men.

Ethnology. The people of Scotland, called Scots or Scotch after a Celtic tribe originally from Ireland, are derived from widely different stocks. The most primitive race were long-headed, and they have been classed with Sergi's Mediterraneans. These were followed by a brachycephalic people like Ripley's Alpine race, but in Scotland they were tall, with massive jaws and broad faces. The third ingredient is a long-headed race, Teutonic and of lofty stature. From the Stone age until the eleventh century of our era there is evidence of a continuous Scandinavian invasion penetrating into the north country and entering largely into the composition of the Scottish Highlanders. They belong to the tallest people in the world, having an average height of 1.746 meters, in Ayrshire 1.782 meters, and in Galloway 1.792 meters; the cephalic index is 76.2–77.9. There are two centres of speech in Scotland. In the north Gaelic is spoken, belonging, with Irish and Manx, to the Gædhelic division of the Celtic mother tongue. In the south it is Lowland Scotch, an interesting local mixture of Scandinavian and English.

HISTORY

At the end of the fifth century the Scots, an Irish people, settled in modern Argyll and soon spread along the western coast from the Clyde to modern Ross. Their kingdom was called Dalriada (q.v.). To the east of them, occupying the whole country north of the Forth, was the Pictish Kingdom (see PICTS), and to their south lay the British Kingdom of Cumbria (q.v.), which extended along the western coast from the Clyde to the border of Wales. The English Kingdom of Bernicia, a part of Northumbria, occupied the remainder of modern Scotland south of the Forth.

The early history of the Dalriad Scots is a narrative of warfare with the other kingdoms. Their first King of whom we have record, Fergus MacErc, is said to have come from Ireland in 502, with the blessing of St. Patrick himself. The Dalriads were Christians, and their King, Conal, gave the isle of Iona to St. Columba, the apostle of the northern Picts. Aidan, another of their kings, repeatedly invaded Bernicia, but was beaten by the heathen Ethelfried at Degastan in 603. There followed a short period of English supremacy over both Scots and Picts, but in the decisive battle of Nechtansmere (685) the latter destroyed an English army, and both peoples became independent. About 730 the Pictish King, Angus MacFergus, subdued both the Scots and the Britons. But internal dissensions and the attacks of the Northmen broke the strength of the Pictish Kingdom, and in 843 Kenneth MacAlpin, King of the Scots, was acknowledged King of Pictland. All the country north of the Forth and the Clyde was thus united into one Kingdom. It was at first called Alban, but in the tenth century the name Scotland became common. Kenneth I (843–860) transferred his seat to Forteviot in Stratherne, the Pictish capital. By the marriage of his daughter to the King of Cumbria he secured an alliance of all the Celts of Scotland against the Teutonic invaders. He often raided Lothian and repulsed the Northmen from Dalriada, but neither he nor his successors could prevent them from occupying the Orkneys and the Shetlands and from obtaining a foothold in the extreme north of Scotland.

The centre of the Scottish Kingdom was the country between the Forth and the Spey, and its kings were constantly engaged in struggles with the rebellious chiefs of Moray. The seven original provinces of Pictland were ruled by underkings, but with the growth of the royal power these kinglets were replaced by mormaors, or great stewards, who were royal officers. The tribal chieftains under them were called toisechs. They, as well as the mormaors, were chosen in the assembly of the free tribesmen from the ruling family. Constantine II (904–943) fixed the royal residence at Scone. In a national council held at Scone (906) he and his Bishop, Cellach, regulated the affairs of the Scottish church. He repeatedly repulsed the Northmen, but later in his reign formed an alliance with them and with Cumbria against the growing power of Athelstan of England. The allies were defeated in the great battle of Brunanburh (937). Constantine also succeeded in placing his brother Donald upon the throne of Cumbria. His successor, Malcolm I (943–954), acquired the southern part of Cumbria (modern Cumberland and Westmoreland) from Edmund, King of England, who had conquered it. But the permanent southern borders of Scotland date from the reign of Malcolm II (1005–34). The royal line of Strathclyde (northern Cumbria) having expired, that country had become a part of Scotland by inheritance. Even more important was the acquisition of Lothian, which Malcolm wrested from the English by his victory of Carham in 1018. Malcolm's attempt to set aside the Scottish law of the succession by the murder of the legitimate heir (i.e., his brother's son) led to the murder of his grandson, Duncan, by Macbeth, Mormaor of Ross and Moray. Shakespeare's wonderful tragedy has treated this event, but his sources were at variance with historic truth. Duncan was in reality an immature youth, and Macbeth, who had married the mother of the true heir and was his guardian, represented the legitimate succession. Far from being a cruel tyrant, he was an able monarch, whose reign of 18 years was one of comparative peace and prosperity.

Feudal Age (1058–1286). The accession of Malcolm III (1058), better known as Malcolm Canmore, marks the beginning of a new epoch in Scottish history. It was the age of the Anglo-Norman influence, of the introduction of the feudal system in church and state, and of the foundation and growth of towns. Scotland left her Celtic isolation and entered the community of European nations. The long residence of Malcolm III in England, and especially his marriage with the sister of Edgar the Atheling, rendered his sympathies English and involved him in English affairs. He espoused their cause against the Norman conquerors and received many of the victims of William's devastation of Northumberland as settlers in Scotland. His

Queen, who was afterward canonized as St. Margaret of Scotland, used her great influence to bring the Celtic church into the communion of Western Christendom by the assimilation of its usages to those of the Roman church. On the death of Malcolm (1093) a Celtic reaction occurred. Donald Bane, the King's brother, was chosen to succeed him, and the English courtiers were driven out of Scotland. But English aid soon placed Malcolm's son Edgar on the throne, and during his reign (1097–1107), as well as during the reigns of his brothers Alexander I and David I, the Anglo-Norman influence triumphed. Edgar's reign was marked by the permanent removal of the royal residence to Edinburgh and by the loss of the Hebrides and part of the western mainland to the Northmen.

During the reigns of Alexander I (1107–24) and David I (1124–53) the feudal system was greatly strengthened in Scotland, both in church and state. Nine bishoprics were created in place of the single bishopric of the Scots, although St. Andrews continued to hold the primacy. Parishes were established and endowed throughout the country. Foreign ecclesiastics took the place of the Scottish monks, and stately new abbeys were founded, especially by David, who began the construction of Holyrood, Melrose, and the other principal abbeys of the Lowlands. Charters were introduced to take the place of ancient Celtic customs, the mormaors became earls, and the toisechs thanes—both royal officers holding their land from the King, who thus became the universal landowner, in place of the tribes. Alexander was still surrounded by Celtic lords, but David portioned out the Lowlands among Norman lords in direct feudal relation to the crown. Nevertheless, the relation of the tenantry to the new lords was the same as it had been to the old, and there was no oppression of the lower classes, such as took place in the Norman conquest of England. The visnet was introduced to take the place of the old practice of compurgation. By this legal process, which was also called the judgment of the peace, every freeman obtained the right to be tried by his peers. The more serious crimes were withdrawn from the lesser courts and made pleas of the crown. The peace thus became the King's peace and was maintained by the sovereign in annual judicial circuits until the first half of the fourteenth century, when four justices were appointed to attend to the pleas of the crown. These reforms were begun by Alexander, but carried out for the most part by David. The latter granted many new charters and privileges to the burghs, which grew and prospered during his reign. He prized peace, but his English possessions and relationships brought on war. As husband of the heiress of Northumberland and brother of the Empress Matilda, he took part in the civil war between her and Stephen. Although defeated in the battle of the Standard, near Northallerton (1138), he nevertheless attained the object of his ambition when he acquired the Earldom of Northumberland for his son Henry. His son William the Lion, who became King in 1165 on the death of his brother Malcolm, was taken prisoner in an invasion of England and compelled by the Treaty of Falaise (1175) to swear fealty to Henry II. Scotland remained a feudal dependency for 14 years, but Richard I of England renounced the treaty for 10,000 marks of silver. William's son, Alexander II, succeeded him and followed his father's policy of siding with the barons of England in their struggle against John. In 1237, however, he renounced his claims to Westmoreland, Cumberland, and Northumberland for a yearly payment of £200. His successor, Alexander III, recovered the western islands from the Northmen by a formal treaty in 1266, though the question had really been decided in the battle of Largs three years earlier. He married his daughter to the young King of Norway, and her only child, the Maid of Norway, was declared heiress to the Scottish throne. The death of Alexander III, in 1286, ended this long and prosperous epoch.

War of Independence (1286–1328). The feudal relations of Scotland and England have given rise to much controversy between the historians of the two countries. The facts of the case seem to be that, while the English kings usually claimed an overlordship, they had never succeeded in enforcing it except in the case of William the Lion noted above. The Scottish kings did homage for their English possessions and for them only. In 1290, however, Edward I obtained a favorable opportunity to press the English claims. The Maid of Norway, granddaughter of Alexander III, died on the voyage to Scotland. Thirteen claimants to the throne appeared. Edward I took the matter into his own hands, claiming this right as suzerain of Scotland. He demanded an acknowledgment of his suzerainty, which was acceded to by the Norman lords and bishops. The Scottish commonalty, however, i.e., the burghs and the gentry, protested, but without avail. At Norham, in 1292, Edward decided in favor of John Baliol (q.v.), a descendant of the royal house by an elder female line. Baliol was a submissive man, but by his high-handed enforcement of feudal claims Edward drove Scotland to revolt and to a league with France—the "auld alliance" with France which lasted over two centuries and a half and was only ruptured by the Reformation. Edward therefore invaded Scotland in 1296 and in the battle of Dunbar defeated the Scottish forces. Baliol was deposed, and the Norman nobility of Scotland readily swore fealty to Edward as their King.

But the Scottish people were unsubdued, and they soon found a leader in William Wallace (q.v.). After a series of remarkable adventures he succeeded in arousing the country against the English, and in the battle of Stirling (1297) he destroyed a superior English army. But in 1298 Edward returned with an overwhelming army and by a new and skillful use of his archers defeated the Scotch at Falkirk. Nevertheless, although Edward repeatedly invaded Scotland, and although in 1305 Wallace was captured and cruelly put to death, the country was not subdued. After the death of Wallace the cause of liberty was taken up by Robert Bruce (q.v.), the grandson of Robert Bruce, Baliol's rival for the throne of Scotland. The nobility supported him as it had never supported Wallace, and he was crowned King at Scone. He gained a series of minor victories over the English and at length completely routed their superior army at Bannockburn in 1314. From that time until 1328, when the independence of Scotland was formally acknowledged, there were constant invasions of northern England.

During the War of Independence the Parliament of Scotland first took its definite form. Its origin is to be found in the feudal council of tenants in chief summoned by David I which

superseded the council of the seven mormaors. To the feudal council belonged the lords spiritual (bishops, abbots, priors) and the lords temporal, including the lesser as well as the greater barons. With the towns the kings negotiated directly in two groups—the four burghs of the south, of which Edinburgh was the leader, and the Hanse burghs of the north, grouped about Aberdeen. The burghs first appear as an estate in the Parliament of Cambuskenneth, which Bruce called in 1326 to aid him in the struggle against England. From this date only can we speak of a Scottish Parliament. The three estates sat in the same House, under the presidency of the Chancellor of the Exchequer. The Scottish Parliament, however, never attained the constitutional importance of the English, because the Scottish kings lived within their means and seldom made demands for money.

Supremacy of the Nobility (1329–1546). In Scotland the nobility was far more powerful than in England. There were many more exemptions from royal judicature, and the royal office of sheriff had become hereditary among the nobility. The prevalence of the tribal system in the Highlands and to some extent in the Lowlands strengthened the nobility, because of the intimate personal relation which existed between tribesmen and chief. Moreover, Scotland was unfortunate during the period following the struggle for independence in having most of her kings succeed as minors. During the minorities disorders and feuds prevailed and peace existed in the royal burghs only. To disorder at home was added almost perpetual warfare on the English border—a dreary chronicle of raids and petty victories on either side. Under David II, the son of Robert Bruce (1329–71), Parliament attained its greatest power, practically conducting the affairs of state and determining the succession to the throne contrary to the King's desire. In 1371 Robert II, a grandson of Robert Bruce, inaugurated the Stuart dynasty. During the latter part of his reign, which ended in 1390, the Duke of Albany was virtual ruler of Scotland, a position which he held under Robert III (1390–1406) and during the minority of James I (1406–37). It was not until some years after his death that James I, who had been prisoner in England since 1405, was permitted to return. James was a prince of great ability. With a strong hand he curbed the nobility, not hesitating to attain his ends by putting to death his opponents. In his attempt to bring order into Scotland he was aided by the towns. He also sought to make Parliament an instrument to crush the nobility. Finding it impossible to induce the lesser nobility to attend Parliament, he ordained in 1428 that two representative knights should be sent from each sheriffdom in the Kingdom, on the model of the English system. This act was unsuccessful, but it became of constitutional importance, because it was reenacted by the Reformation Parliament in 1560 and in 1585 was finally established as a law.

During the following reigns there was more lawlessness than ever. Some of the nobility were always engaged in treasonable negotiations with England. Chief among the King's opponents had always been the Lords of the Isles, who ruled over what was practically an independent principality in the west. The great house of Douglas, famous in border raids, was also very troublesome. Under James II (1437–60) there was some wise legislation improving the condition of the lesser tenantry and encouraging tillage. The marriage of James III (1460–88) with the daughter of the King of Norway brought the Orkneys into the possession of Scotland in 1469. James IV (1488–1513) married Margaret Tudor, the daughter of Henry VII, thus opening the way to peace with England. But family quarrels with Henry VIII and the renewal of the French alliance led to a Scottish invasion of England, which resulted in the defeat and death of James on Flodden Field in 1513. Under James V (1513–42) the College of Justice, the Scottish supreme court, was established on the model of the Parlement of Paris in 1532. James's chief minister was Cardinal Beaton, the Archbishop of St. Andrews, who played in Scotland the rôle of Cardinal Wolsey in England, but with greater success. After the death of James V he directed the destinies of Scotland. Henry VIII's barbarous invasion, in which towns were burned, the country was laid waste, and all the inhabitants that resisted were slain, thwarted that monarch's design for a marriage between the infant Queen of Scotland and the heir to the English throne. For a time the same policy was continued by the Protector Somerset, and this so incensed the Scotch that Mary was sent to France to marry the Dauphin. With the assassination of Cardinal Beaton in 1546 the power of the Catholic church in Scotland was over.

The Reformation and its Consequences (1543–1688). James V, although he compelled the clergy to reform abuses, resisted the efforts of Henry VIII to make him join the Reformation. After his death Mary of Guise, the Queen mother, in vain attempted to compromise. In 1559 John Knox (q.v.) returned to Scotland and became the greatest power in effecting the Reformation. Urged by his fiery eloquence, many of the nobility organized against the bishops under the name of the Lords of the Congregation. They went through the land suppressing the mass, destroying images, and plundering the monasteries. The Regent secured French aid, but with the assistance of Elizabeth the rebellious nobles more than held their own. Peace came in 1560 with the Treaty of Edinburgh, which provided for the withdrawal of both French and English forces, leaving Scotland to settle her own church affairs. In that year the Reformation Parliament assembled and adopted a thoroughly Calvinistic Confession of Faith drawn up by John Knox and established the church on a democratic and Presbyterian basis. See PRESBYTERIANISM, *The Presbyterian Churches in Scotland.*

The subsequent history of Scotland until the Union is the story of its church, the democratic government of which, like the Parliament in England, trained the people for political liberty. During the Civil War the Scots united with the Parliamentarians and by creating a diversion in the north divided the King's forces. The restoration of Charles II was followed by the restoration of episcopacy and the bloody persecution of the Covenanters, who adhered to the Presbyterian faith. But the nation remained Presbyterian, and in 1689 the Scottish Parliament passed a bill of rights more radical than the English and invited William to ascend the throne. In 1690 episcopacy was definitely abolished and Presbyterianism was restored to the position of a state religion. The frequent changes in religion were brought about by acts of Parliament, which was entirely under the

King's control. A chief source of parliamentary weakness lay in the growth of the committee system. As early as the fourteenth century business had been referred to two committees called the Lords of the Articles, chosen from the three estates. Consolidated by James V into a single body, this committee obtained such power that by the sixteenth century Parliament met merely to confirm its decisions. In 1621 a change in the method of its appointment enabled the King to fill it with his partisans and thus control Parliament. But in 1690 the committee of the Articles was abolished, and from that time until the Union Scotland had parliamentary rule.

The Union with England. In consequence of the massacre of Glencoe in 1692 and of the hostile attitude of the English Parliament towards the Scottish colony at Darien, the Scottish Parliament echoed the popular feeling of hostility towards England. It met the English desire for union with the demand for free trade and equal rights in the colonies, and on being refused this it passed the Act of Security (1703), practically excluding the successor of Queen Anne from the Scottish throne and providing for compulsory military training of every Scotsman. In retaliation the English Parliament passed several laws greatly restricting the trading privileges of the Scotch. For a year or two there was imminent danger that the Scots would proceed to extreme measures, but in 1707 the Parliament agreed to the Act of Union. Charges of bribery were made, and the whole proceeding was execrated by the people of Scotland. As finally passed the Act gave Scotland a representation of 45 in the British House of Commons and 16 in the House of Lords, the whole Scottish peerage electing the latter for the parliamentary term of the British Parliament. Scotland received free trade and retained her church and laws. Her debt was consolidated with England's.

The history of Scotland since the Union cannot be separated from that of Great Britain (q.v.). The most important change that has come over the country is its transformation from an agricultural to an industrial community. A disastrous change in the land tenure and population of the Highlands occurred as a result of the participation of the clans in the Jacobite rebellion of 1745–46. The Highland language and customs were suppressed by law, and the tribal ownership of land was abolished. As a result the lords converted the common lands into sheep walks and deer parks, compelling the tribesmen to migrate, unless they wished to remain as tenants at will under wretched conditions. These evils were only in part remedied by the Crofters Act of 1880. See REFORMATION, THE PROTESTANT.

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SCOTLAND, CHURCH OF. See PRESBYTERIANISM.

SCOTLAND YARD. A group of buildings surrounding a courtyard at the southeast corner of Charing Cross, London, England, long famous as the headquarters of the Metropolitan

Police Force. It derives its name from a palace assigned from the time of Edgar to Henry II as the residence of the Scottish kings whenever they should desire to visit London. New Scotland Yard, the police headquarters since 1890, is on the Thames Embankment.

SCOTS GREYS. The oldest dragoon regiment in the British army. It was raised in Scotland in 1683 and under normal conditions is mounted entirely on gray chargers. Throughout its history it has been one of the most distinguished regiments in the British service and made a notable record in the Great European War of 1914. The dress uniform differs from the other British dragoon regiments, in that the bearskin busby (q.v.) is worn instead of the dragoon helmet. Its title previous to the Great War was the Second Dragoons, Royal Scots Greys regiment of cavalry.

SCOTS LAW. The same as Scotch law (q.v.).

SCOTT, ALEXANDER (?1525–?1584). A Scottish poet whose love lyrics are fresh in feeling and technically notable, though often coarse. Except that his poems (preserved in the Bannatyne manuscript) were written between 1545 and 1568, nothing is certainly known of his life, though probably he lived at or near Edinburgh. He can be read in the edition of D. Laing (1st collected ed., privately printed, Glasgow, 1882) and in the Scottish Text Society edition (ed. by James Cranstoun, 1896). Consult C. M. Maclean, *Alexander Scott* (New York, 1915).

SCOTT, AUSTIN (1848–1922). An American educator, born at Maumee, Ohio. He graduated at Yale in 1869, spent a year in graduate study at the University of Michigan, and in 1871–73 studied history at Berlin and Leipzig. From 1873 to 1875 he was instructor in German at the University of Michigan; then became an associate in history in the newly established Johns Hopkins University, where he organized and directed the seminar of American history. During 1875–82 he also assisted George Bancroft in collecting and arranging the material for his *History of the Constitution of the United States.* In 1883 he became professor of history and economics at Rutgers College, was president of the institution from 1890 to 1906, and thenceforth served as professor of history and political science.

SCOTT, CHARLES (1733–1813). An American soldier, born in Cumberland Co., Va. He served as a noncommissioned officer under Braddock in 1755, was captain of the first company in the Revolutionary War raised south of the James, became a colonel in August, 1776, distinguished himself at Trenton, and in April, 1777, was made a brigadier general. In 1780 he was taken prisoner at Charleston and was not exchanged until the close of the war. Removing to Kentucky in 1785, he served as brigadier general under Gen. St. Clair in 1791, and in 1794 was one of Wayne's officers at the battle of Fallen Timbers. He was Governor of Kentucky from 1808 to 1812.

SCOTT, CHARLES FELTON (1864–). An American electrical engineer, born in Athens Co., Ohio. He graduated from the State university in 1885 and studied at Johns Hopkins in 1885–87. In 1888 he became connected with the Westinghouse Electric and Manufacturing Company, for which he was assistant electrician (1891–93), electrician (1893–96), chief electrician (1896–1904), and consulting engineer (1904–11). Thenceforth he held the chair of electrical engineering at the Sheffield Scientific School (Yale). Scott served as president of the Engineers' Society of Western Pennsylvania in 1902 and of the American Institute of Electrical Engineers in 1902–03.

SCOTT, CLEMENT WILLIAM (1841–1904). An English journalist and author, born in London and educated at Marlborough School. He entered the War Office as clerk in 1860 and retired on a pension in 1879. He was thereafter until 1898 on the editorial staff of the *Daily Telegraph,* to which paper he had contributed dramatic criticisms since 1871. Scott also edited a monthly, *The Theatre,* from 1880 to 1889. He is the author of *Lays of a Londoner* (1882); *Lays and Lyrics* (1888); *Round about the Islands* (1873); *Poppy Land Papers* (1885); *Pictures round the World* (1894); *Among the Apple Orchards* (1895); *Sisters by the Sea* (1897). He is author, or part author, of the following plays: *Diplomacy, Peril,* and *Odette,* all adapted from Sardou; *The Vicarage* and *Off the Line,* also adaptations from the French. His dramatic criticisms include: *From "The Bells" to "King Arthur"* (1896); *The Drama of Yesterday and To-Day* (1899); *Ellen Terry* (1900); *Some Notable Hamlets of the Present Time* (1900; 2d ed., 1905). Though by no means a great dramatic critic, Scott in his prime was a leader of popular opinion in matters theatrical.

SCOTT, DAVID (1806–49). A Scottish historical and portrait painter, etcher, engraver, and author, born at Edinburgh. Practically self-taught, he exhibited his first important picture, the "Hopes of Early Genius Dispelled by Death," at the Scottish Academy in 1828. In 1832 he visited Italy and Paris. He returned to Edinburgh in 1834 and was elected a member of the Scottish Academy in 1835. Although an artist of undoubted merit, he failed to win the appreciation of the public. His feverish and eager haste to portray his ideas hampered his execution, and his lack of a sound technique led him into exaggerated draftsmanship, but his color was often very fine, and the subject matter is portrayed with remarkable dramatic skill. Most of his paintings are in private collections in Scotland. The National Gallery of Edinburgh possesses the "Vintager" and "Ariel and Caliban." Other paintings include: "Achilles Addressing the Manes of Patroclus," Sunderland Art Gallery; "The Spirit of the Storm," Trinity House, Leith; the "Descent from the Cross," Smith Institute, Stirling; and portraits of Dr. John Brown and of Emerson (Public Library, Concord, Mass.). As an illustrator and engraver Scott executed noteworthy works, particularly in his designs for his *Monograms of Man* (1831), a set of six remarkable etchings somewhat resembling those of Max Klinger and drawn in delicate outline on copper, and his designs for Coleridge's *Ancient Mariner,* begun in the same year, published in London (1837), a series characterized by vivid imagination and great power. The 40 illustrations to *Pilgrim's Progress* and a series of 18 designs to Nichol's *Architecture of the Heavens* were both issued after his death. Consult W. B. Scott, *Memoir of David Scott* (Edinburgh, 1850), and J. L. Caw, *Scottish Painting, Past and Present* (New York, 1908).

SCOTT, DUNCAN CAMPBELL (1862–). A Canadian poet, born in Ottawa, Ontario. He

was educated at Stanstead Wesleyan College. Having entered the Canadian civil service, he rose rapidly to the position of chief clerk and accountant (1893). His published verse comprises: *The Magic House* (1893); *Labour and the Angel* (1898); *New World Lyrics and Ballads* (1905); *Via Borealis* (1906). *The Village of Viger* (1896) is a collection of 10 short stories of Canadian country life. He wrote also *John Graves Simcoe* (1905), in the "Makers of Canada Series," which, with Pelham Edgar, he edited. Consult William Archer, *Poets of the Younger Generation* (New York, 1902).

SCOTT, Edward John Long (1840–). An English scholar and author, born in Bridgewater, Somerset. He graduated at Lincoln College, Oxford, in 1862, in 1863 entered the manuscript department of the British Museum, and for some years after 1888 was keeper of the manuscripts and Egerton librarian. He received the degree of D.Litt. from Oxford. His publications include: *Introduction to Reprint of Eikon Basilike* (1880); *Private Diary of Shakespeare's Cousin, Thomas Greene, Town-Clerk of Stratford-on-Avon* (1885); *William Harvey's Original Lectures on the Circulation of the Blood* (1886); verse translations of the *Eclogues* of Vergil (1884) and the *Eclogues* of Calpurnius (1890).

SCOTT, Fred Newton (1860–). An American English scholar, born in Terre Haute, Ind. He was educated at the University of Michigan (A.B., 1884; Ph.D., 1889), where he rose from instructor to be professor of rhetoric (1901). He served as president of the Modern Language Association in 1907 and of the National Council of Teachers of English in 1911–13 and was actively interested in problems of college and secondary education. He wrote *Aesthetics: Its Problems and Literature* (1890); *Principles of Style* (1890); *Memorable Passages from the Bible* (1906); *Selections from the Old Testament* (1910). He was joint author of, among other books: *Guide to the Literature of Aesthetics* (1890); *Composition-Rhetoric* (1897); *Introduction to Literary Criticism* (1899); *The Teaching of English* (1903); *Aphorisms for Teachers of English Composition* (1905).

SCOTT, Sir George Gilbert (1811–78). An English architect. He was born at Gawcott, Buckinghamshire, and in 1827 was articled to a London architect. Influenced by the writings of Pugin, he became a leading spirit of the Gothic revival and was employed in restoring many of the old English cathedrals, including Westminster Abbey and Ely Cathedral, and in building churches. Prominent among his secular edifices are the Albert Memorial and the ministerial buildings of the War, Foreign, Home, and Colonial offices. He became a member of the Royal Academy in 1861 and was made professor of architecture, his collection of lectures being published under the title *Mediæval Architecture* (2 vols., London, 1879). He was president of the Royal Institute of British Architects in 1873–76 and was knighted in 1872. He was buried in Westminster Abbey. Consult his *Recollections* (London, 1879).

SCOTT, Harvey W. (1838–1910). An American newspaper editor, born in Tazewell Co., Ill., but a resident of Oregon after 1852. In the early sixties he joined the staff of the Portland *Oregonian*, of which he was editor and principal owner from 1865 until his death. Through Scott's efforts this newspaper became one of the most influential on the Pacific coast. He refused to support the free-silver movement in 1896, although this attitude cost the paper many subscribers at the time. Some of his political quarrels, particularly that with Senator Mitchell of Oregon, became historic in the Northwest.

SCOTT, Hugh Lenox (1853–). An American soldier, born at Danville, Ky., a brother of William Berryman Scott. Upon graduating from West Point in 1876, he entered the cavalry and during a long period thereafter served in a number of expeditions against the Indians. An Indian troop in the Seventh Cavalry, in which he had enlisted in 1892, he commanded till 1897. He was successively adjutant general of Cuba (1898–1903), governor of the Sulu Archipelago (1903–06, within which time he abolished slavery in the islands), superintendent and commandant at West Point (1906–10), with the rank of colonel. Scott was promoted to brigadier general in 1913 and was placed in command of the Second Cavalry Brigade, intrusted with patrolling the Texas border while Mexican disturbances should continue. Part of 1915, however, he spent in Utah in a successful effort to pacify an outlaw band of Piute Indians. His skill in settling similar troubles through combined military and diplomatic persuasion had already gained him an enviable reputation. Scott had been made chief of the general staff in 1914 and in 1915 was promoted from brigadier to major general. In August of the latter year he secured assurances from General Villa (q.v.) relative to the safety of American lives and property on the Mexican border. He published several monographs and reports on the sign language of the Plains Indians. Princeton and Columbia gave him honorary degrees.

SCOTT, Hugh Stowell (1862–1903). An English author, born at Newcastle-upon-Tyne. He was better known by his pseudonym, Henry Seton Merriman. His works include: *Phantom Future* (1889); *Suspense* (1890); *Prisoners and Captives* (1891); *Slave of the Lamp* (1892); *With Edged Tools* (1894); *Grey Lady* (1895); *The Sowers* (1896); *In Kedar's Tents* (1897); *Flotsam* (1898); *Roden's Corner* (1898); *Isle of Unrest* (1900); *Velvet Glove* (1901); *The Vultures* (1902). A memorial edition of 14 novels appeared in 1909–10 in 14 volumes.

SCOTT, Irving Murray (1837–1903). An American shipbuilder and ironmaster, born in Hebron Mills, Baltimore Co., Md. He entered the employ of the Union Iron Works of San Francisco as draftsman in 1858. He designed much mining machinery. On his suggestion as general manager the Union Iron Works added in 1884 shipbuilding to the construction of mining machinery and built for the United States government the *Charleston, Oregon, San Francisco, Olympia, Wisconsin,* and *Ohio.* He was a trustee of Leland Stanford Junior University and a prominent figure in the Republican party of the Pacific coast.

SCOTT, James. See Monmouth, James, Duke of.

SCOTT, James Brown (1866–). An American authority on international law, born in Kincardine, Ontario. He was educated at Harvard (A.B., 1890; A.M., 1891), as Parker fellow of which university he traveled in Europe and studied in the universities of Berlin, Heidel-

berg (J.U.D.), and Paris. Afterward he practiced law at Los Angeles, Cal., from 1894 until 1899. He founded the law school of the University of Southern California and was its dean from 1896 to 1899, although absent for part of that time with a California regiment of infantry in the Spanish-American War. From 1899 to 1903 he was dean of the college of law at the University of Illinois, for three years was professor of law at Columbia, and at George Washington University was professor of law in 1905–06 and thereafter professor of international law. As solicitor of the State Department at Washington (1906–11) he was counsel for the United States in several important cases, particularly that of the North Atlantic Fisheries Arbitration before The Hague in 1910; and in 1907 he had been expert on international law to the United States delegation at the Second Hague Peace Conference. In 1909 he was appointed lecturer on the special subject at Johns Hopkins. Of the Carnegie Endowment for International Peace he became secretary. Besides serving as editor in chief of the *American Journal of International Law* and as editor of the *American Case Book Series*, and writing numerous articles on international law and the peace movement, he published: *Cases on International Law* (2d ed., 1908); *Cases on Quasi Contracts* (1905); *Cases on Equity Jurisdiction* (2 vols., 1906); *Argument of Senator Root in the Fisheries Arbitration* (1911); *The Status of the International Court of Justice* (1914); and several works on The Hague Conferences of 1899 and 1907 (1908, 1909, 1915). In his special field Scott contributed to the NEW INTERNATIONAL ENCYCLOPÆDIA.

SCOTT, JOHN. See ELDON, JOHN SCOTT, EARL OF.

SCOTT, JOHN MORIN (1730–84). An American patriot soldier and legislator, born in New York. He graduated at Yale in 1746, became prominent as a lawyer in New York, and was conspicuous as an early opponent of the British Ministry, being one of the organizers of the Sons of Liberty. In 1775 he became a member of the New York General Committee, served in the Provincial Congress in 1775–76, and as brigadier general took part in the battle of Long Island. In 1777 he resigned his commission and subsequently served as Secretary of State of New York in 1777–79 and as a member of the Continental Congress in 1780–83.

SCOTT, LEVI (1802–82). An American Methodist Episcopal bishop, born at Odessa, Del., and self-educated. He entered the ministry of the Methodist Episcopal church, joining the Philadelphia conference in 1825. From 1840 to 1843 he was principal of the Dickinson College Grammar School, from 1848 to 1852 was one of the agents of the Methodist Book Concern in New York, and in 1852 was elected Bishop. Shortly afterward he visited the missions in Liberia. Consult James Mitchell, *The Life and Times of Levi Scott* (New York, 1885).

SCOTT, MICHAEL. See SCOT, MICHAEL.

SCOTT, ORANGE (1800–47). An American clergyman, born at Brookfield, Vt. His formal education was limited to 13 months in the public schools. In 1822 he entered the ministry of the Methodist Episcopal church, joining the New England conference. In 1833 he became a zealous antislavery worker. In 1842, however, he with others withdrew from the Methodist Episcopal church and on May 31, 1843, at a general convention held at Utica, N. Y., they founded the Wesleyan Methodist Church of America. Scott was the presiding officer of the convention. He was the editor of the *True Wesleyan* from 1842 to 1844. Ill health compelled his retirement from the ministry in 1846. He was the author of *A New and Improved Campmeeting Hymnbook* (1830); *An Appeal to the Methodist Episcopal Church* (1838); *Slavery and the Church* (1838); *Church Government and the Declaration of Rights* (1844).

SCOTT, SIR PERCY (1853–). A British naval officer. Entering the navy in 1866, he served in the Ashanti War of 1873–74, in the Congo expedition in 1875, and in the Egyptian War in 1882. In 1893 he was promoted to captain. He participated in the South African War (1899–1900) and in the China War (1900) and at various times served on the Ordnance Committee, on the Committee on Naval Uniforms, and on the Naval Exhibition Committee. Sir Percy invented a night-signaling apparatus for naval use, gun carriages for 6-inch and 4.7-inch guns used in South Africa, and appliances for improving heavy-gun shooting. In 1913 he was promoted to full admiral, created Baronet, and retired, but when the European War broke out in 1914 he reëntered the service and later was placed in charge of the aërial defenses of London.

SCOTT, or **SCOT,** REGINALD or REYNOLD (c.1538–99). An English writer against the witchcraft superstition, son of Richard Scott of Smeeth, Kent. After an uncompleted course at Oxford he returned to Kent to live as a country gentleman. His famous work, *The Discoverie of Witchcraft* (1584), was designed to demonstrate the absurdity of the belief in witchcraft. It is marked by passages of sense and humane feeling, qualities that excited the antipathy of King James, who replied in his *Dæmonology* (1597). On coming to the English throne James ordered Scott's book burned. Scott also published a valuable book entitled *A Perfect Platform of a Hop Garden* (1574). The *Discoverie* was edited by Brinsley Nicholson (London, 1886).

SCOTT, SIR RICHARD WILLIAM (1825–1913). A Canadian statesman, born in Prescott, Ontario. He was educated privately and was admitted to the bar in 1848 and from 1857 to 1863 sat in the Canada Legislative Assembly. In 1867–73 he was a Liberal member of the first Ontario Assembly, of which he was elected Speaker in 1871. From 1872 to 1873 he was Commissioner of Crownlands for Ontario. Scott was called to the Dominion Senate in 1874. In 1874–78 he was Secretary of State and Registrar-General of Canada in the administration of Alexander Mackenzie. He carried through the separate Catholic school law of Ontario Province, and in 1878 the Canada local-option temperance act, generally styled the Scott Act. In 1896–1908 he was Secretary of State in the Laurier administration. In 1909 he was knighted.

SCOTT, ROBERT (1811–87). An English clergyman and scholar. He was born at Bondleigh in Devonshire and educated at Christ Church, Oxford. In 1834 he had taken holy orders and held various ecclesiastical preferments until 1854, when he was elected master of Balliol in opposition to Jowett, who was to be his successor. In 1870 he accepted the deanery of Rochester and

held it until his death. Scott's name is most widely known by his joint authorship, with H. G. Liddell, of the great Greek-English lexicon, whose appearance in 1843 was epoch-making for English scholarship. For the next 40 years Liddell and Scott worked diligently at revision and addition, until the seventh edition (1883) was practically an original work, though the first had been based on the German lexicon of Passow.

SCOTT, Robert Falcon (1868–1912). An English naval officer and Antarctic explorer, born at Outlands, Devonport, June 6, 1868. He entered the navy at the age of 14 and first attracted attention as torpedo lieutenant of H.M.S. *Majestic*, where his associations with Arctic explorers led to his future career. Placed in command of the Royal Geographical Antarctic expedition (1901–04), he established its land base on the shores of McMurdoo Sound. To the east of the Ross Oceanic Ice Cap (barrier) he discovered King Edward VII Land (see Polar Research), and he personally led a party which made a record latitude of 82° 17′ S. and also sledged over glacier-clad Victoria Land to lat. 78° S., long. 147° E. His staff did scientific work of marked importance. His rewards were unusual—he was promoted to be post captain (the youngest captain in the royal navy), was made Companion of the Victorian Order, and received the degree of LL.D. from the Universities of Cambridge and Manchester. Gold medals were awarded him by a number of geographical societies.

Scott renewed Antarctic exploration as commander of the British National expedition (1910–14), which operated from McMurdoo Sound base. Scientific work of varied and important order was done by the expedition. Its great achievement, however, was its attainment of the South Pole by the longest continuous sledge journey (1842 miles) ever made in the polar regions. Scott reached the South Pole Jan. 18, 1912, five weeks later than Amundsen. He found Amundsen's Norwegian flag, tent, etc., and carried away a photograph and notes regarding these. The return journey ended in the loss of the entire detachment. Evans died from a fall; Oates (q.v.) sacrificed his life, hoping thus to save his comrades; Bowers, Wilson (q.v.), and Scott perished from starvation and exposure (March 29, 1912), within 155 miles of the home station. The casualty was due to several causes—long stretches of soft snow, prolonged gales, the collection and hauling of geological specimens to what proved their death camp, the accident to Evans, continuance of very low temperatures (from —30° by day to —47° at night in early autumn), and finally the party was blizzard-bound within 11 miles of a large depot that would have insured safety. On March 25, four days before his death, Scott wrote his manly message to England, saying in part: "I do not regret this journey, which has shown that Englishmen can endure hardships, help one another, and meet death with as great fortitude as ever in the past. . . . We have been willing to give our lives for this enterprise, which is for the honor of our country." In 1915 a bronze statue of Captain Scott, showing him in his Arctic dress, was unveiled at Waterloo Place, London. Subscribed for by the officers of the navy, it was the work of the explorer's wife, who after her husband's death was known as Lady Scott. For full accounts, consult Scott's own *Voyage of the Discovery* (London, 1905) and the posthumous *Scott's Last Expedition* (ib., 1913).

SCOTT, Robert Henry (1833–1916). A British meteorologist, born in Dublin, Ireland, and educated there at Trinity College and in Berlin and Munich. He was keeper of the mineralogical museum of the Royal Dublin Society from 1862 to 1867 and thereafter served as director of the British Meteorological Office until 1900. He wrote *Volumetric Analysis* (1862); *Weather Charts and Storm Warnings* (1876; 3d ed., rev., 1887); *Elementary Meteorology* (1883).

SCOTT, Robert Kingston (1826–1900). An American soldier and politician, born in Armstrong Co., Pa. In 1861 he was chosen lieutenant colonel of the Sixty-eighth Ohio Regiment and next year was promoted colonel. He fought at Fort Donelson, Shiloh, and Corinth, was in the campaign against Vicksburg, was taken prisoner near Atlanta in 1864, but was shortly afterward exchanged and served during the remainder of the war with General Sherman. In 1868 he was elected Governor of South Carolina and in 1870 was reëlected. During his corrupt administration the State debt increased about $13,000,000. In his second administration Ku-Klux Klan (q.v.) disorders became so numerous in some parts of the State that President Grant, to whom Scott appealed, under the authority conferred by the Enforcement Act of 1871, suspended the writ of habeas corpus in some of the counties and many offenders were tried by the Federal courts. In 1881 he was tried for shooting and killing W. G. Drury, but was acquitted on the plea that the shooting was accidental. Consult J. S. Pike, *The Prostrate State* (New York, 1874), and H. A. Herbert and others, *Why the Solid South?* (Baltimore, 1890).

SCOTT, Thomas (1705–75). An English hymn writer, son of an Independent minister of Hitchin in Hertfordshire and himself a minister. *Lyric Poems, Devotional and Moral* (1773), sufficiently represent him. His sister, Elizabeth Scott (?1708–76), likewise wrote many hymns.

SCOTT, Thomas (1747–1821). An English Bible commentator. He was born at Braytoft, Lincolnshire, and spent the early years of his life as a grazier. Ordained priest in 1773, he held several livings successively. Among his publications are: *The Force of Truth* (1779); *The Articles of the Synod of Dort* (trans. 1818); and his commentary on the Bible (5 vols., 1788–92), which had immense circulation and influence in its day. His collected works appeared in 10 volumes (1823–25), and his *Letters and Papers* (1824) were edited by his son, who also wrote his *Life* (1822), including in it an autobiographical fragment. Consult also A. C. Downer, *Thomas Scott the Commentator* (London, 1909).

SCOTT, Thomas Alexander (1824–81). An American railroad manager, born in Franklin Co., Pa. Entering the service of the Pennsylvania Railroad in 1851, he was rapidly promoted and in 1859 became vice president. In 1861 he was appointed by President Lincoln Assistant Secretary of War, in which capacity he reorganized the entire system of transportation. Returning to the service of the Pennsylvania Railroad, he inaugurated the policy of securing control of Western railway lines for operation in connection with the Pennsylvania system

He was president at different times of various railroad lines and from 1874 until a short time before his death was president of the Pennsylvania Railroad.

SCOTT, Sir Walter (1771–1832). A famous British novelist and poet. He was born in Edinburgh, Aug. 15, 1771, of an old border family, the Scotts of Harden, an offshoot from the house of Buccleuch. Although he became a robust and healthy man, as a child Scott was sickly. His childhood was passed for the most part at Sandy Knowe, the farm of his grandfather, in Roxburghshire. His early familiarity with the ballads and legends then floating over all that part of the country probably did more than any other influence to determine the sphere of his future literary activity. Between 1778 and 1783 he attended the high school of Edinburgh, where, despite occasional flashes of talent, he shone considerably more as a bold, high-spirited boy with an odd turn for story-telling than as a student. In 1783 he began attending the University of Edinburgh, where he continued about two years, it would seem, not greatly to his advantage. Afterward, at the height of his fame, he was wont to speak with deep regret of his neglect of early opportunities. But, though leaving college scantily furnished with the knowledge formally taught there, he had been hiving up in his own way stores of valuable though unassorted information. From his earliest childhood onward he was an insatiable reader, and of what he either read or observed he seems to have forgotten almost nothing. He was a fairly good Latinist, of Greek he knew nothing, but he acquired a serviceable knowledge of French, Italian, Spanish, and German.

In music he showed no talent. In 1786 he was articled apprentice to his father; in 1788 he began to study for the bar, to which he was called in 1792. In his profession he had fair success, and in 1797 he married Charlotte Margaret Carpenter, the daughter of a French refugee named Jean Charpentier. Towards the end of 1799, through the interest of his friends Lord Melville and the Duke of Buccleuch, he was made sheriff depute of Selkirkshire, an appointment which brought him £300 a year with not very much to do for it. Meantime, in a tentative and intermittent way, his leisure had been occupied with literature, which more and more distinctly announced itself as the main business of his life. Excepting a disputation on being called to the bar, his first publication, a translation of Bürger's ballads *Lenore* and *The Wild Huntsman*, was issued in 1796. In 1799 appeared his translation of Goethe's drama of *Götz von Berlichingen;* and at this time he was writing for Monk Lewis the fine ballads, *Glenfinlas*, the *Eve of St. John*, and the *Grey Brother*. In 1802 Scott published the first two volumes of his *Border Minstrelsy*, which were followed in 1863 by a third and final one. This work, the fruit of those "raids"—as he called them—over the border counties, in which he had been wont to spend his vacations, won for him at once prominence among the literary men of the time. In 1804 he issued an edition of the old poem *Sir Tristram*, admirably edited and elucidated by valuable dissertations. Meantime *The Lay of the Last Minstrel* had been in progress, and on its publication in 1805 Scott found himself the most popular poet of the day. During the next 10 years, besides a mass of miscellaneous work, the most important items of which were elaborate editions of Dryden (1808) and of Swift (19 vols., 1814), including in each case a memoir, he gave to the world the poems *Marmion* (1808); *The Lady of the Lake* (1810); *The Vision of Don Roderick* (1811); *Rokeby* (1813); *The Bridal of Triermain* (1813); and *The Lord of the Isles* (1815). The enthusiasm with which the earlier of these works were received somewhat abated as the series proceeded. The charm of novelty was no longer felt, and the poetry had deteriorated. Moreover, in the bold outburst of Byron, with his deeper vein of sentiment and energy of passion, a formidable rival had appeared. All this Scott distinctly noted, and after what he felt as the comparative failure of *The Lord of the Isles* in 1815, he published, with the trivial exception of the anonymous *Harold the Dauntless* (1817), no more poetry. But already in *Waverley, or 'Tis Sixty Years Since*, which appeared without his name in 1814, he had achieved the first of a new series of triumphs. *Guy Mannering* (1815), *The Antiquary* (1816), *Old Mortality*, *The Black Dwarf* (1817, really 1816), *Rob Roy* (1818), and *The Heart of Midlothian* (1818) rapidly followed. The remainder of the famous group known as the Waverley novels form the most splendid series of historical portraits in any language. *The Bride of Lammermoor* (1819); *The Legend of Montrose* (1819); *Ivanhoe* (1820, really 1819); *The Monastery* (1820); *Kenilworth* (1821); *Quentin Durward* (1823); *The Talisman* (1825)—these are among the most enduring of those great stories which enchanted Europe and had an immense influence on the development of fiction.

Scott was now at the height of his fame and prosperity. He was living at Abbotsford, the "romance in stone" he had built for himself in the border country which he loved. There he entertained with princely hospitality admirers of many types. In 1820 he was created Baronet. But his fortunes, secure as they seemed, were built upon insecure foundations. In 1805 Scott's income, as calculated by his biographer, was about £1000 a year, irrespective of what literature might bring him, a competency shortly increased, on his appointment to a clerkship of the Court of Session, by £1300. But what was ample for all prosaic needs seemed poor to Scott's imagination. In 1805, lured by the hope of immense profits, he secretly joined James Ballantyne, an old schoolfellow, in a large printing business in Edinburgh. To this, a few years afterward, a publishing business was added, under the nominal conduct of John Ballantyne, a brother of James; Scott in the new adventure becoming, as before, a partner. Gradually the affairs of the two firms became complicated with those of the great house of Constable & Co., in the sudden collapse of which in 1826 the Ballantynes were involved to the extent of £120,000. Compromise with their creditors would have been easy. But Scott regarded the debt as personal. "If I live and retain my health," said Scott, "no man shall lose a penny by me." And, somewhat declined as he now was from the first vigor and elasticity of his strength, he set himself to liquidate by his pen this large sum. The stream of novels now flowed swiftly. *A Life of Napoleon* (1827), in nine volumes, was undertaken and completed, with much other miscellaneous work; and within a space of two years Scott had realized for his

creditors nearly £40,000. A new and annotated edition of the novels (begun in 1829) was issued with immense success; and there seemed every prospect that within a reasonable period Scott might again face the world, as he had pledged himself to do, owing no man a penny. In this severe labor he broke down. In 1830 he was smitten with paralysis, from which he never thoroughly rallied. It was hoped that the climate of Italy might benefit him. The Admiralty placed at his disposal a man-of-war on which he took a Mediterranean voyage, touching at Malta and Naples. But in Italy he pined for the home to which he returned only to die. At Abbotsford, on Sept. 21, 1832, he passed away, with his children round him. On the 26th he was buried beside his wife (died 1826) in the beautiful ruins of Dryburgh Abbey. By the sale of copyrights all Scott's debts were liquidated in 1847.

In regard to Scott's poetry there is now little difference of opinion. Its genuine merits continue to secure for it some part of the popular favor with which it was at first received. Deficient though it be in certain of the higher and deeper qualities and in finish, it is admirable in its frank abandon, in its boldness and breadth of effect, its succession of clear pictures, and its rapid and fiery movement. Scattered here and there are little snatches of ballad and song scarcely surpassed in our language. As a novelist Scott had some shortcomings. With the artistic instinct granted him in largest measure, he had little of the artistic conscience. Writing offhand, he would not watch his work as it proceeded. Hence he is an exceedingly irregular writer; many of his works are in structure most lax and careless, and some of the very greatest of them are marred by occasional infusions of obviously inferior matter. Yet it may be doubted whether in mass and stature Scott is quite reached by any other English novelist. Of Scott's novels, those dealing most intimately with Scottish life are the best. As a force Scott's influence has been immense. He discovered the historical novel, and from him proceed the countless tales of national life since written in Great Britain, throughout Europe, and in the United States. Scott, too, gave to fiction that encyclopædic character since exemplified in Balzac, Dickens, and Thackeray. He did more than all other men of his time to enlarge our vision by extending it over wide stretches of history. He also revolutionized the current conceptions of history as a body of dry facts. His logical successor was Macaulay.

Scott's miscellaneous prose works were collected in Edinburgh in 1827; in 1834 and in 1841 in London. His poems and novels exist in many editions. The following list includes notable works not already mentioned: *Apology for Tales of Terror* (12 copies privately printed, 1799); "Ballads," in Lewis's *Tales of Wonder* (1801); *Ballads and Lyrical Pieces* (1806); "Abstract of Eyrbiggia Saga," in Jameson's *Northern Antiquities* (1814); "Chivalry" and "Drama," in Supplement to *Encyclopædia Britannica* (1814); *Introduction to Border Antiquities* (1814–17); *The Field of Waterloo* (1815); *Paul's Letters to his Kinsfolk* (1815); *The Search after Happiness, or the Quest of Sultan Solimaun*, and Kemble's address on the *Sale Room* (1817); *Account of the Regalia of Scotland* (1819); *The Visionary by Somnambulus*, a political satire, republished from the *Edinburgh Weekly Journal* (1819); *The Abbot* (1820); biographies in Ballantyne's *Novelists* (1821); *Account of George III's Coronation* (1821); *The Pirate* (1822); *Halidon Hill* (1822); "Macduff's Cross," in Joanna Baillie's *Poetical Miscellanies* (1822); *The Fortunes of Nigel* (1822); *Peveril of the Peak* (1822–23); *St. Ronan's Well* (1824); *Redgauntlet* (1824); *Tales of the Crusaders; The Betrothed* (1825); *Thoughts on the Proposed Change of Currency* (1826); *Woodstock, or the Cavalier: A Tale of 1651* (1826); *Chronicles of the Canongate* (1st series): *The Two Drovers, The Highland Widow, The Surgeon's Daughter* (1827); *Tales of a Grandfather* (4 series, 1828, 1829, 1830, 1830); *Chronicles of the Canongate* (2d series); *St. Valentine's Day, or the Fair Maid of Perth* (1828); "My Aunt Margaret's Mirror," "The Tapestried Chamber," and "The Laird's Jock," in the *Keepsake* for 1828; *Religious Discourses, by a Layman* (1828); *Anne of Geierstein* (1829); "History of Scotland," in Lardner's *Cabinet Encyclopædia* (1830); *Letters on Demonology and Witchcraft*, in Murray's Family Library (1830); "House of Aspen," in the *Keepsake* (1830); *Doom of Devorgoil* and *Auchindrane* (1830); *Essays on Ballad Poetry* (1830); *Tales of my Landlord* (4th series); *Count Robert of Paris; Castle Dangerous* (1831).

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SCOTT, WALTER (1867–). A Canadian statesman. He was born in Middlesex County, Ontario, and in early manhood went to the Canadian Northwest, finally settling at Regina, now the capital of Saskatchewan. He was engaged in newspaper work during 1892–1906, but left active work on the press for politics, be-

coming Liberal member of the House of Commons for West Assiniboia. He took part in the negotiations which resulted in the federal laws creating the provinces of Alberta and Saskatchewan and in 1905 resigned his seat in the Commons, having been elected leader of the Saskatchewan Provincial Liberals. He became Premier of Saskatchewan in 1905 and in 1915 still held that position, having also been Minister of Public Works (1905–12), and Minister of Education since 1912.

SCOTT, WILLIAM. See STOWELL, WILLIAM SCOTT, BARON.

SCOTT, WILLIAM AMASA (1862–). An American economist, born at Clarkson, Monroe Co., N. Y., and educated at the University of Rochester (A.B., 1886) and at Johns Hopkins (Ph.D., 1892). He had taught political economy in the University of South Dakota from 1887 to 1890, and, on leaving Johns Hopkins, where he had acted as instructor in history, became assistant professor of economics in the University of Wisconsin, was titular professor from 1897 to 1900, and thereafter director of the school of commerce and professor of economic history and theory. His publications include *Repudiation of State Debts* (1893); *Money and Banking* (1903; 4th ed., rev., 1910); *Money* (1913); *Banking* (1914).

SCOTT, WILLIAM BELL (1811–90). A Scottish poet and painter, born in Edinburgh. He was a son of Robert Scott, the engraver, and a younger brother of David Scott (q.v.), the distinguished painter. He studied art at the government academy and in the British Museum and worked with his father at engraving. In 1837 he began his career in London as etcher and painter. In 1844 he was appointed master of the government schools of design at Newcastle-on-Tyne, a post which he occupied with distinction till 1864. In the meantime he had executed a series of large pictures for Sir Walter Trevelyan at Wallington Hall, taking his subjects from border history and legend; and a few years later he also painted a series of designs from the *King's Quair* for the stairway at Penkill Castle in Perthshire. His last years were passed at Chelsea, near his friend D. G. Rossetti (q.v.), and at Penkill Castle with another friend, Miss Boyd. Among Scott's published designs is *William Blake: Etchings from his Works* (1878). On art or artists he wrote a *Memoir of David Scott* (1850); *Albert Dürer: His Life and Works* (1869); *The British School of Sculpture* (1872); *Our British Landscape Painters* (1872); *Murillo and the Spanish School* (1873); and works on the modern schools in France, Belgium, and Germany. His own illustrations added to the charm of these books. Scott began writing verse while living in Edinburgh. He was strongly under the influence of Blake and Shelley, and later he came under the spell of Rossetti. His finest poems are contained in *Ballads, Studies from Nature, Sonnets, etc.* (1875), and in *A Poet's Harvest Home* (1882). Consult Scott's *Autobiographical Notes* (ed. by W. Minto, London, 1892).

SCOTT, WILLIAM BERRYMAN (1858–). An American geologist, brother of Gen. Hugh L. Scott. He was born in Cincinnati and was educated at Princeton University (class of 1877) and at Heidelberg (Ph.D., 1880). After serving for a year as assistant in geology at Princeton, he was appointed in 1884 professor of geology and paleontology. The Princeton geological expeditions in the West and in Patagonia (Reports, 8 vols.) were conducted by him, and he made valuable additions to the geological and ornithological collections of the university. Scott served as president of the American Society of Naturalists in 1896, was elected (1906) to the National Academy of Sciences, was awarded (1910) the Wollaston medal of the Geological Society of London, and received honorary degrees from the University of Pennsylvania, Harvard, and Oxford. Besides many valuable monographs he wrote *An Introduction to Geology* (1897; 2d ed., 1907); *A History of Land Mammals in the Western Hemisphere* (1913).

SCOTT, WINFIELD (1786–1866). A distinguished American soldier. He was born near Petersburg, Va., of Scottish ancestry, June 13, 1786, attended William and Mary College for a time, and was admitted to the bar in 1806. In 1808, however, he abandoned the legal profession and accepted an appointment as captain of light artillery. While stationed at Natchez in 1810, he was court-martialed for accusing his superior officer, General Wilkinson, of complicity in the conspiracy of Aaron Burr and was temporarily suspended from the army. Upon the outbreak of the War of 1812 he was appointed lieutenant colonel and sent to the Canadian frontier. He crossed with his regiment to Queenston, where the American troops were at first successful, but, the British troops being reënforced, the Americans were repulsed with heavy loss and Scott was taken prisoner. In the following year he was exchanged and was then appointed adjutant general with the rank of colonel. During the same year he was wounded by an explosion of a powder magazine after the attack on Fort George. In 1814 he was promoted to the rank of brigadier general. On July 5 he fought and won the battle of Chippewa and on the 25th fought in the battle of Lundy's Lane (q.v.), in which he was twice wounded, the last time severely. He declined the appointment of Secretary of War at the close of hostilities and was raised by Congress to the rank of major general. He then prepared a set of extensive general regulations for the army, which was the first complete manual of military tactics prepared in the United States. In 1832 he concluded treaties of peace with various Indian tribes of the West. In 1838 he supervised the removal of the Cherokee Indians from the Southern States to a reservation west of the Mississippi.

In 1841 he was appointed commander of the United States army to succeed General Macomb. In 1847 he was given the chief command of the United States army in Mexico and on March 9 landed a force of 12,000 men at Vera Cruz, at once investing and bombarding the city, which surrendered on the 26th. On April 18 he carried the heights of Cerro Gordo, and on May 15 entered Puebla, where he waited for reënforcements. On August 19–20 he won the brilliant victories of Contreras and Churubusco. These were soon followed by the sharp and sanguinary battles of Molino del Rey and Chapultepec on the 8th and 13th of September respectively. On September 14, with less than 8000 soldiers, he entered the city of Mexico and occupied the national palace. (See MEXICAN WAR.) General Scott returned from the war with great fame as a soldier and in 1852 was nominated as the Whig candidate for the presidency, but carried only four States. In 1855

the office of lieutenant general was revived by Congress in order that it might be conferred by brevet on General Scott. Increasing age and infirmity prevented him from taking active command of the army during the Civil War, and in October, 1861, he retired from active service. Subsequently he visited Europe and afterward settled at West Point, where he died May 29, 1866. His autobiography was published in two volumes at New York in 1864.

Consult: Raphael Semmes, *Campaign of General Scott in the Valley of Mexico* (Cincinnati, 1852); E. D. Winfield, *Life and Services of General Winfield Scott* (New York, 1858); M. J. Wright, *General Winfield Scott*, in "Great Commanders Series" (ib., 1894); James Barnes, *Giant of Three Wars* (ib., 1903).

SCOTT'DALE. A borough in Westmoreland Co., Pa., 49 miles southeast of Pittsburgh, on branches of the Pennsylvania and the Baltimore and Ohio railroads (Map: Pennsylvania, B 7). It is the centre of the Frick coke interests and has steel and iron pipe mills, brass and silver works, a casket factory, a large milk-pasteurizing plant, and machine shops. Pop., 1900, 4261; 1910, 5456.

SCOTTI, skŏt'tē, ANTONIO (1866–). An Italian dramatic basso, born at Naples. He received his entire musical education from Madame Paganini and made his début in 1889 in Malta as Amonasro in *Aida*. His magnificent voice and splendid histrionic ability won instant recognition, so that for the next 10 years he was in constant demand at the principal theatres of Italy and South America. His tours of Spain and Russia won him international reputation. When Grau in 1899 heard him at Covent Garden he immediately engaged him for the Metropolitan Opera House in New York, where he made his first appearance in December of the same year. Thereafter he was one of the principal attractions of the New York operatic season. His repertory comprises chiefly Italian rôles, but he is unsurpassed as Don Giovanni in Mozart's opera of that name.

SCOTTISH. See also SCOTCH.

SCOTTISH ACADEMY, ROYAL. An institution devoted to painting, sculpture, and the encouragement of the fine arts, formed at Edinburgh, Scotland, in 1826 and incorporated by royal charter in 1838. It was modeled after the Royal Academy of London and in the early years of its existence occupied a range of galleries in the building of the Royal Institution, in which its annual exhibitions were then held. In 1854 the National Gallery, a building to be devoted to the fine arts, was completed and provision was made for the exhibitions of painting and sculpture of the Royal Scottish Academy which are annually held there. Accommodation is also afforded in the building for the schools of the academy.

SCOTTISH GAELIC LITERATURE. Throughout the Old Irish period and most of the Middle Irish the Gaelic countries may be said to have had a common literary tradition. Intercourse was easy between the two divisions of the Gaelic world, and the bards passed freely back and forth. The scenes of ancient sagas like the *Longes Mac n-Usnig* were laid on both sides of the Irish Sea, and the hero tales of Cuchulainn and of the Fenians were current in the Scottish Highlands. Unfortunately the early monuments of Scottish Gaelic are very scanty. The *Book of Deir*, a Latin Gospel book of the ninth century, contains Gaelic passages relating to grants of land and other privileges to the monastery of Deir which show that the language of the eleventh and twelfth centuries still stood very near to the Irish of Ireland. Furthermore, a number of Middle Irish manuscripts are preserved in the libraries of Scotland.

Not until the sixteenth century did the language and literature of Scotland have an independent development. The beginning is marked by *The Book of the Dean of Lismore*, a manuscript collection of poems compiled from 1512 to 1526 by Sir James Macgregor, dean of Lismore, and his brother Duncan, and containing much valuable Ossianic material. Though the compositions are principally by Irish bards, the native poets are also well represented. To the seventeenth century belong the *Book of Fernaig*, compiled between 1688 and 1693 and containing mainly political and religious poems, and the *Red and Black Books of Clanranald*, of which the former figured largely in the Ossianic controversy. The first printed prose work was Bishop Carsewell's translation of John Knox's liturgy (1567), and a great part of the Highland literature ever since, like that of modern Wales, has been theological in character. There have not been lacking secular poets, however, the successors of the ancient Irish bards whose name they still preserved. In the seventeenth century the most famous were Mary MacLeod (1569–1674) and John Macdonald (?–1710); in the eighteenth, Alexander Macdonald (1700–?), author of the first Gaelic vocabulary, published in 1741, Robert Mackay (Rob Donn) (1714–78), Dugald Buchanan (1716–68), composer of religious poems, Duncan Ban McIntyre, the poet of nature, and William Ross (1762–90); and in the early nineteenth, Ewen MacLauchlan (1775–1822), who translated the *Iliad* into Gaelic, and Evan Maccoll (1808–98) were of special note.

The portion of Gaelic literature that has been most widely known and discussed is the Ossianic poetry. (See MACPHERSON, JAMES; OSSIAN.) Though the works of Macpherson and his followers are utterly unlike the real Ossianic literature, they rendered a real service to Gaelic literature in that they made it known abroad and gave the impulse to the collection of popular poetry at home. During the last hundred years or more a large mass of both ballads and folk tales has been printed, and the work of collection is still going on. See IRISH LITERATURE, *Gaelic;* SCOTTISH LANGUAGE AND LITERATURE.

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SCOTTISH LANGUAGE AND LITERATURE. By the Scottish language is meant the English dialect once cultivated in Scotland and now spoken in remote districts. When, in the fourteenth century, English becomes again a cultivated language after the linguistic disturbances following the Norman Conquest, it falls into three clearly marked dialects: the southern (south of the Thames), the midland (the central counties of England), and the northern, spoken and written from the Humber to the north as far as the Teutons had settled in Scotland. For England the midland dialect, the language of the court, soon became the standard. But Scotland in the meantime had won her independence at Bannockburn (1314) and had established her own government, which she maintained till the union of the crowns by the accession of James to the English throne (1603). More precisely, then, the Scottish language is the cultivated language of Scotland from about 1310 to 1603. From the standard English of England it differed originally in sounds, in spelling, and in syntax. And these differences subsequently increased, owing to the hostility between the two countries. The Scottish dialect also came under the influence of the Gaelic and the Kymric, from which many words were taken. It was in the north, too, that the Norsemen, settling in the ninth and tenth centuries, influenced in vocabulary and perhaps in syntax the speech of the people by whom they were absorbed. Moreover, Scotland was for a long period in close alliance with France. Scotchmen went to France rather than to England to complete their education, and they entered the French service in large numbers. As a result there was introduced into the Scottish dialect a body of French words not found in the literature south of the Tweed. To the vernacular of Scotland as a cultivated language the Reformation proved a deathblow, for it put an end to the friendship with Catholic France and eventually brought to the cottage of the Scottish peasant the Bible written in the standard English of the south.

Except for some fragments of minstrelsy and the romances which in origin may go back to the mysterious Thomas the Rhymer, Scottish vernacular literature begins with John Barbour, Archdeacon of Aberdeen, whose *Bruce* (1375) appeared while Chaucer, then in his prime, was showing the artistic possibilities of the new English as spoken in London. Barbour's poem, narrating the exploits of Robert Bruce from his wanderings as an outlaw in the mountains to his victory at Bannockburn and then on to Irish and other wars, gave stirring expression to the Scottish feeling of independent nationality. Andrew Wyntoun, prior of St. Serf's Inch in Loch Leven, followed Barbour with a metrical history called the *Orygynalle Chronykil of Scotland* (c.1424). Though less exultant in its patriotism than the *Bruce*, this poem is nevertheless very significant as a plain narrative of events in Scotland founded on the best traditions and authorities at the command of the author. Literature had thus discovered the hero and the history of Scotland. Patriotic themes were continued by others, especially by Henry the Minstrel, or Blind Harry (towards the close of the fifteenth century), who matched Barbour's poem with *William Wallace*, pervaded with the spirit of freedom. Oddly enough, Scottish verse had already come under the influence of Chaucer. Patriotism proved weaker than the sense for form and beauty. The first and best of the Chaucerians was James I, who ruled Scotland from 1420 to 1437. For 19 years he had been held in captivity by the English, and while in the Tower of London he is said to have composed *The Kingis Quair* (i.e., *The King's Book*), an allegorical poem reminiscent of Chaucer's translation of the *Romance of the Rose*. In previous Scottish poetry the octosyllabic rhyming couplet had usually been employed. James adopted the seven-line stanza of Chaucer. His language, too, with its infusion of English words, was not strictly Scottish. Chaucer's influence in the north reached its height in *The Testament of Cresseid* by Robert Henryson of Dunfermlin (died c.1506), long attributed to Chaucer himself. It is a continuation of *Troilus and Cressida*. Henryson was also the author of *Robene and Makyne*, the earliest pastoral in any English dialect, and of several delightful fables in verse. The greatest name of this period is William Dunbar (died c.1513), who was connected with the court of James IV. He was likewise affiliated with the school of Chaucer by *The Goldyn Targe* and *The Thrissill and the Rois*. His masterpiece is the grim *Dance of the Sevin Deidly Synnes*. Gavin Duglas (died 1522), who also handled allegorical themes in *The Palice of Honour*, translated Vergil's *Æneid*, to the various books of which he prefixed remarkable verse descriptions of the months and seasons. A poet more widely read was Sir David Lindsay (died c.1555), who possessed rare power of observation and a vigorous style. His richly imaginative *Dreme* was followed by several trenchant satires on abuses in church and state, such as *The Testament and Complaynt of our Soverane Lordis Papyngo*, and an interlude entitled *Ane Pleasant Satyre of the Thrie Estaitis*, interesting as a link in the history of the English drama and as a vivid picture of contemporary manners. Lindsay was the last of the great poets distinctly Scottish. After him Scottish verse lost itself in the bitter theological debates of the Reformation. In the period we have covered there had appeared many poets of less fame and a large body of anonymous verse. Particular attention should be called to the popular ballads, which, like the Scottish *Chevy Chace*, far surpass in imaginative detail similar work in England.

If the Reformation, as has been said, proved uncongenial to Scottish verse, it gave an impetus to Scottish prose. Much of this prose, however, hardly rises to the plane of literature. The earliest prose work of interest was Bellenden's translation (completed 1533) of Hector Boece's *Historia Scotorum*. Of greater importance was *The Complaynt of Scotlande* (printed 1549), whose authorship is still uncertain. It is a curious and brilliant satire on Scotland. Scottish prose attained its most effective power in *The History of the Reformation* (completed 1564) and the various tractates of John Knox. Other prose writers of the period were Robert Lindsay of Pitscottie (died 1565?), author of a continuation of Boece's chronicle history; George Buchanan, who wrote both in Latin and in the vernacular; and Bishop John Leslie (died 1596), the leading Roman Catholic historian of Scotland. Scottish prose may be said to end with James VI, author of *Demonologie* (1587) and other treatises. After ascending the English throne as James I in 1603, he adopted in his books the language of the south.

The Scottish poets of the time, like Sir William Alexander and William Drummond of Hawthornden, commonly followed the example of King James. But there were some exceptions. Several balladists among the aristocracy, as Robert Sempill (died c.1695) and Lady Wardlaw (died 1727), continued the traditions of the early poets. The language of the peasantry still remained Scottish, and several writers of the eighteenth century attempted to restore the native speech to literature. Allan Ramsay (died 1758) gained immense popularity by his songs composed in a mixture of Scottish and standard English. After Ramsay came a group of imitators, and then the fine vernacular verse of Robert Fergusson (died 1774), who is rightly regarded as the forerunner of Robert Burns. A peasant by birth and thus at home in the vernacular, Burns added to his knowledge by reading Fergusson, Ramsay, and the poets of the old period. In Burns the humor and pathos of native Scottish song reached its highest point. The tradition of Scottish song was kept up with varied success by John Mayne (died 1836), Hector MacNeil (died 1818), Joanna Baillie (died 1851), Lady Nairne (died 1845), James Hogg (died 1835), Robert Tannahill (died 1810), and Allan Cunningham (died 1842). Others continue to write good songs occasionally. But Scottish verse since Burns has run into a sort of Scotch-English, which announces its end. It should be observed that the revival of the Scottish dialect has had an important influence on the novel. Sir Walter Scott's characters taken from the peasantry speak this native speech. And more recently Barrie and Watson ("Ian Maclaren") have written admirable stories in the dialect of remote parishes. S. R. Crockett and J. J. Bell should also be mentioned.

The above sketch can be filled out by reference to the individual authors mentioned in it. See also ENGLISH LITERATURE; SCOTTISH GAELIC LITERATURE.

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SCOTTISH SCHOOL OF PHILOSOPHY. A designation of the philosophic tendency represented by Thomas Reid, Sir William Hamilton, James Beattie, James Oswald, Dugald Stewart, James McCŏsh, and others. The leading tenet of the school is that we have an immediate and intuitive knowledge of the external world and of first principles. Consult James McCosh, *The Scottish Philosophy* (new ed., New York, 1875), and Andrew Seth, *Scottish Philosophy* (3d ed., Edinburgh, 1899). See the articles on the above-named thinkers; also PHILOSOPHY.

SCO'TUS, DUNS. A mediæval schoolman. See DUNS SCOTUS.

SCOTUS, JOHANNES. A philosopher of the ninth century. See ERIGENA.

SCOURFISH. See ESCOLAR.

SCOURGE OF GOD, THE. A name given to Attila, King of the Huns, who was the terror of Europe in the fifth century.

SCOURING OF WOOL. See BLEACHING.

SCOURING RUSH. See EQUISETUM.

SCRAG WHALE (so called because the back is scragged instead of finned). The name of two different whales. That in the North Atlantic is a rorqual (*Agelophus gibbosus*), which reaches about 50 feet in length, has no dorsal fin, and has whitish baleen. This mammal is known in Australia and New Zealand as the Australian whale (*Neobalæna marginata*). The pygmy whale (*Cogia breviceps*) is from 8 to 10 feet long. It is found off New Zealand.

SCRAN'TON. The third city in population of Pennsylvania and the county seat of Lackawanna County, situated on the Lackawanna River, 167 miles by rail north of Philadelphia and 134 miles northwest of New York (Map: Pennsylvania, K 3). Five railroads enter the city: the Delaware, Lackawanna, and Western, main line and Bloomsburg division; the Delaware and Hudson, main line; the New York, Ontario, and Western; the Erie (Wyoming division); and the Central Railroad of New Jersey. The street-railway system comprises 56 miles of well-constructed road. There is also an electric railroad connecting Scranton with Wilkes-Barre, which lies 18 miles to the south. Scranton has a picturesque location in the Lackawanna valley, on the plateau at the confluence of Roaring Brook and the river. The city, which has an area of 20½ square miles, is situated at elevations ranging from 800 feet to nearly 1800 feet above the sea. There are 149 miles of streets and avenues in addition to traveled courts and places.

Among the notable public edifices are the United States Government Building, Court House, City Hall, Albright Memorial Library, Moses Taylor Hospital, State Hospital, the Oral

School for the Deaf and Dumb, Museum of Natural History, and the Central High School. Other noteworthy structures are the international Correspondence School, the Y. M. C. A., the Y. W. C. A., the Home of the Friendless, the Board of Trade, the Hotel Jermyn, the Hotel Casey, the Masonic Temple, the Scranton Life Insurance Company Building, and the spacious Connell Building. The city has a public library which maintains five branches, having an aggregate of 85,000 volumes and 9000 manuscripts. There are 47 school buildings, surpassed by none in the State in architecture and modern improvements, besides several colleges and academies, an Historical Society, and a Society of Natural Science. The two public parks contain 100 acres. The valuation of property (1915) was $87,000,000.

Scranton is the centre of the great anthracite-coal region and is one of the principal distributing points for coal. There is invested in incorporated manufacturing establishments $25,000,000, yielding a product valued at $26,000,000 annually. The leading plants include a nut and bolt manufactory, a lace-curtain mill, knitting mills, iron foundries, locomotive and stationary engine works, and 22 silk mills. The government is vested in a mayor, elected every four years, a city controller, and a council of five members, elected at large every four years, and administrative departments as follows: public safety, public works, assessors, city treasurer, city controller, city attorney, city clerk, and sinking-fund commission. The city spends annually, in maintenance and operation, over $900,000. The public schools are under the direction of a board of control, on which each ward has a representative. The total expenditures for school purposes, including repairs, salaries, and maintenance for the year 1914, were $900,000.

The city was founded by Joseph H. and George W. Scranton in 1840. It was incorporated as a borough in 1854, chartered as a third-class city in 1866, and became a second-class city in 1901. Pop., 1860, 20,000; 1870, 35,092; 1880, 43,850; 1890, 75,215; 1900, 102,026; 1910, 129,867; 1915 (U. S. est.), 144,081; 1920, 137,783. Consult F. L. Hitchcock, *History of Scranton and its People* (2 vols., New York, 1914).

SCRANTON, George Whitefield (1811–61). An American manufacturer, born in Madison, Conn. In 1839, with his brother, Joseph H. Scranton, he established an iron manufactory at Slocum, Pa., which was afterward named Scranton for them. He was one of the organizers of the Delaware, Lackawanna, and Western Railway and served for many years as its president, being also president of other railroads and transportation companies.

SCRATCH CRADLE. See Cratch Cradle.

SCREAMER. Any of three curious South American birds, the relationship of which has been a matter of considerable discussion. They are now regarded as most nearly related to the anseriform birds and forming a family (Palamedeidæ). The bill is rather short, conical, curved at the extremity; there is a bare space around the eyes; the toes are long; each wing is furnished with two strong spurs, one at the bend of the wing and a smaller one nearer the tip. The horned screamer, or anhima, chaha, or kamichi (*Palamedea conuta*), inhabits swamps in Brazil, Guiana, and Argentina and feeds on the leaves and seeds of aquatic plants. It is of a blackish-brown color, is nearly as large as a turkey, and has somewhat the appearance of a gallinaceous bird. It receives its name from its loud and harsh cry. From the head, a little

CRESTED SCREAMER (*Chauna cristata*).

behind the bill, there rises a long slender, movable horn, the use of which is not clear. The spurs of the wings are supposed to be useful in defense against snakes and other enemies.

Closely allied to this is the genus *Chauna*, to which belongs the chauna, or crested screamer (*Chauna cristata*), a native of Brazil, Paraguay, and Argentina, the head of which has no horn, but is adorned with erectile feathers. The plumage is mostly lead-colored and blackish. The wings are armed with spurs. It is capable of domestication and is sometimes reared with flocks of geese and turkeys to defend them from vultures, being a bold and powerful bird. Consult Sclater and Hudson, *Argentine Ornithology* (London, 1888), and A. H. Evans, "Birds," in *Cambridge Natural History*, vol. ix (New York, 1900).

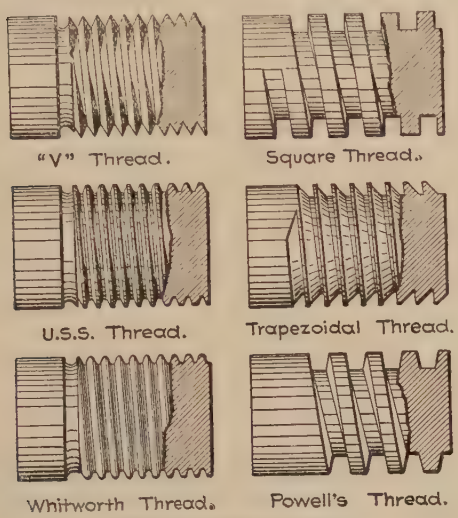
SCREECH OWL. See Owl.

SCREEN (OF. *escren, escrein, escran*, Fr. *écran*, screen, probably from OHG. *scranna*, Ger. *Schranne*, bench, shambles, railing, grate, court). In architecture, an inclosure, or partition of wood, stone, or metal work, especially a partition which does not extend to the ceiling. Screens are frequent in churches, where they separate chapels and choir from the nave and frequently inclose the choir all around. The rood screen in front of the choir is especially important. In Europe beautifully carved screens in stone abound, as at York, Lincoln, Durham, Amiens, Chartres, and Albi; and specimens in wood, carved and painted, are common in parish churches. The term "screen of columns" is also applied to an open detached colonnade. Consult Francis Bond, *Screens and Galleries in English Churches* (London, 1912).

SCREW (OF. *escroue, escroe, escro*, Fr. *écrou*, screw, perhaps from Lat. *scrobs*, ditch, trench, or more probably from Lat. *scrofa*, sow). An inclined plane wrapped around a cylinder in such a manner that the height of the plane is parallel to the axis of the cylinder. If the screw is formed upon the inner surface of a hollow cylinder, it is usually called a nut. Defined less technically, a screw is a solid cylinder having a helicoidal rib, ridge, or thread pro-

jecting from its surface. Historically the invention of the screw is ascribed to Archimedes (250 B.C.). It was used by the Romans of the Empire in their wine and oil presses and was probably familiar to many Mediterranean peoples at the beginning of the Christian era.

It is one of the most extensively used of the elementary mechanisms and is employed in the manufacture and operation of nearly all structures, machines, and mechanisms. The force for operating the screw is universally applied at the



STANDARD SCREW THREADS.

end of a lever arm at right angles to the axis of the screw. When used for transmitting energy the screw is generally operated in connection with a nut; either the screw or the nut may be fixed, the other being movable.

Until the nineteenth century the manufacture of screws was a rather crude process of forging and cutting with hand tools. At present large screws for transmitting energy are made on screw-cutting lathes, the cylinder of metal being rotated by the lathe in front of a tool, which advances at a uniform speed parallel to the axis of the work and thus cuts a helicoidal groove. Generally such screws are made with rectangular threads. The most common forms of screws are wood screws for cabinet and carpenter work and machine screws for metal work. Machine screws are made with care to secure precision in the forms and dimensions of the thread, but wood screws are more roughly made. These small screws were little known or used before 1836, being rudely made by hand with imperfect tools. The head was forged or swaged by a blacksmith; the thread and nick were formed by the use of hand dies and hack saws. In 1836, as a result of an American invention, the old hand tools were transformed into machines having the capacity of imparting to each tool its proper motion. The swaging hammer became the heading machine, receiving the end of a coil of wire and regularly cutting the required length for a blank, which then received such a blow as to set up one end of the wire to form the head—the operation continuing automatically until the whole coil was made into blanks. These blanks were then handled individually and presented to organized machines, first for shaving the head, then for nicking, and lastly for cutting the thread. The above constitutes the second era in this manufacture, and such machinery, partly automatic, was all that was in use before 1846. Then a third era ensued, and an entire revolution was effected by constituting the machines entirely automatic. The blanks are by this system supplied in mass by the operator, the machine separating and handling each blank respectively as the nature of the operation demands, and producing finished screws with wonderful rapidity, regularity, and perfection.

Formerly all wood screws were cut screws, i.e., the metal of the body of the blank was cut away in grooves, leaving the thread projecting. In recent years, however, a process of rolling and press working has been employed by which the threads are raised without loss of the metal between them. In nearly all cases the threads of wood screws and machine screws are triangular in shape. The extensive use of screws has led to standard shapes and dimensions being adopted for screw threads. In England this standard is the Whitworth thread, designed by Sir Joseph Whitworth; in the United States it is the United States standard or Sellers thread, devised by William Sellers, of Philadelphia. There are also the international standard thread (metric system), the British Association standard thread (also metric), the standard thread of the Association of Licensed Automobile Manufacturers (United States, 1906), and others more special. These standards relate particularly to the threads of machine screws, bolts, nuts, etc. For tables of dimensions of screw threads and various other data regarding the use and efficiency of screws, consult American Society of Mechanical Engineers, *Transactions*, vol. xxiii (New York, 1902), and William Kent, *Mechanical Engineers' Pocket-Book* (9th ed., ib., 1916). See ENDLESS SCREW, and Plate of METAL-WORKING MACHINERY.

SCREW BEAN. See MESQUITE TREE.

SCREW DOCK. A dry dock in which the floor carrying the vessel to be docked is elevated by means of screws. Screw docks are few in number and usually of small capacity.

SCREW PINE (*Pandanus*). A genus of plants of the family Pandanaceæ, natives of

SCREW PINE (*Pandanus utilis*).

tropical Asia and of the South Sea Islands. Many of them are remarkable for their prop roots. Their spiny-edged, sword-shaped leaves,

3 to 4 feet long, are spirally arranged in three rows. *Pandanus odoratissimus* is a widely distributed spreading and branching tree, 25 feet high, much used in India for hedges. It grows readily in a poor soil and is one of the first plants to appear on newly formed islands in the Pacific. The leaves are used in thatching, and their tough longitudinal fibres for making hats and cordage. More valuable as a fibre plant is an allied species, *Pandanus utilis*, the vacoa of Mauritius, which grows to a height of about 30 feet, but from continual cropping of its leaves usually grows to 6 or 10 feet. The fibres of its leaves are used for making bags, which rival in cheapness and usefulness the gunny bags of India. In temperate and northern climates these plants are commonly cultivated in greenhouses for ornament. See PANDANACEÆ.

SCREW PROPELLER. A contrivance for propelling vessels which acts in the water like a screw bolt in a nut. It consists of a hub of cylindrical or spherical shape to which are attached the blades that form the screw. Screw propellers are cast in one piece or built up, the blades being attached to the hub with bolts. The latter plan is now common, though small screws are usually cast in one piece. Propellers are made of cast iron, cast steel, or bronze. The best are made of bronze of fine quality, because, though not equal to steel in strength, it corrodes very slowly—a very important point, as the corrosion not only diminishes the strength, but makes the blades rough and ragged at the edges, thereby reducing their efficiency.

The blades of a screw propeller may be considered as parts of separate threads winding around the hub and shaft, cut off by planes perpendicular to the shaft and at a distance apart about equal to the length of the hub. A simple true screw would be made of such form, but experiment has shown that some variations from the simple form are desirable. In the first place the edges of the blades must be sharp and the thickness near the hub sufficient to stand the strain of propulsion. The outer ends are pointed or have the corners cut off to reduce the vibration, and in many screws the driving or leading edge is thrown to the rear from the normal radial line for the same reason. The number of blades varies from two to four. Two-bladed screws are at least as economical in smooth water as screws with more blades, but in rough water the vibration may become excessive. Four-bladed screws of large diameter are generally used in the merchant service for slow-moving engines. The propellers of tugs are relatively large and have broad blades in order to possess adequate thrust. For fast vessels, merchant or naval, three-bladed screws are the rule.

The pitch of a propeller is its linear advance in one revolution, supposing the water to be immovable and the screw to turn in it as a bolt turns in a nut. If we imagine the thread to extend sufficiently along the shaft to make one complete revolution, the pitch is equal to the length of shaft required for this. In the true screw the pitch is constant at all points, but in propellers there are usually some variations in this respect, particularly near the hub in those which are cast and have small hubs. Many propellers are designed to have slightly varying pitch at different parts of the blade, but the advantages of this have never been conclusively determined. The hub, or boss, is now very commonly spherical with a conical tailpiece. Since the part of the blade near a relatively small hub is of little use, hubs are now made quite large, one-sixth to one-fourth the diameter of the screw. The diameter of the screw depends upon many things, and no absolute rule can be laid down, though approximate rules are given in some textbooks. It is now general practice to record experimental data and design the screws in accordance with the results of actual practice, with such variations as the particular characteristics of the ship and machinery seem to require.

As it works in a yielding fluid, the propeller in ships of ordinary form has a greater speed than would be required if it turned in a solid nut. The difference in the distance traversed in the two cases is called the "apparent slip." In all cases, however, the propeller acts upon water already in motion, so that the real slip, which represents the backward velocity of the water acted upon by the screw, may differ considerably from the apparent slip. The speed of this following water is difficult to ascertain, so that the slip ordinarily referred to is the apparent slip. If v represents the speed of the vessel, s the speed of the screw, and w the forward speed of the water, then

$$\text{real slip} = \frac{s-(v-w)}{s} = \frac{s+w-v}{s}.$$

Since a ship can move only by driving water astern, it is plain that negative real slip is impossible; but from the formula given it is evident that, if w is large, real slip might exist even if v exceeded s. In rare cases, with vessels of exceptional form, negative slip has been observed; it always indicates a wasteful expenditure of power, for the force which gives forward motion to the water is derived from the ship in some way (bad shape of hull, frictional resistance, etc.). It must be noted that real slip —and therefore usually apparent slip—is a necessity of screw propulsion and does not of itself indicate loss of power. It is a necessary sequence of the action of a screw in a yielding fluid. The slip may be too great or too small, however; in the former case the pitch is probably (i.e., supposing no other cause operative) too great; if it is too small, the pitch is probably too little. The efficiency of the various forms of propellers differs but little provided their pitch, blade area, etc., are suitable to the conditions of their use; but several changes have to be made in some instances before these details are correctly determined. The most important point to be considered in propulsive efficiency is the shape of the vessel's hull. The shape of the bow (i.e., the entrance) is not so important, however, as that of the stern (i.e., the run); the former may be quite full and bluff without greatly reducing the speed except at very high velocities, but the latter must be very hollow or lean or the water will not flow in solid to the propeller or propellers except at low speeds.

The screw is secured to the end of an iron or steel shaft called the propeller shaft or tail shaft, which connects to the line shafting that in turn joins the crank shaft at the engines. The push or thrust of the screw is received on the thrust bearing, which has a series of raised lugs or collars and grooves fitting over or into similar ones in the shaft. Slow vessels and

small vessels usually have a single screw. Large, fast ships are now generally fitted with two or more screws. Some vessels with turbine engines have as many as nine screws, three on each shaft, and an old Russian circular-armored ship has six screws, each on a separate shaft. The advantages of multiple screws are that the very large power needed in modern fast vessels may be divided instead of being supplied by one ponderous engine, and the difficulties and dangers of breakdowns much reduced. By reducing the size and increasing the number and speed of screws a greater engine efficiency is obtained with directly connected turbines. A still further efficiency has been effected by gearing the turbines or electric motors to the propeller shaft, thus enabling the screw and the motive power to move at the speed at which each is most efficient.

A Scottish barrister, John MacGregor, in a paper read before the British Society of Arts in 1858, said: "The use of the screw propeller may be of indefinite antiquity," and added: "A model of one was brought from China in 1680 which had two sets of blades turning in opposite directions." In 1746 Bouguer mentions that "working arms, like the arms of a windmill," were tried for the propulsion of vessels. In 1752 the great Swiss mathematician, Daniel Bernoulli, received a prize from the French Academy of Sciences for an essay on the manner of propelling boats by steam in which he proposed the use of a screw. In 1770 the use of the screw was suggested by James Watt. During the American Revolution David Bushnell, an ingenious and patriotic citizen, made a practical submarine boat propelled by a screw turned by hand power and actually used the boat in an attempt to blow up a British man-of-war. See TORPEDO BOAT, SUBMARINE.

Two Americans, Oliver Evans and John Fitch, experimented with screw propellers between 1780 and 1790. In 1801 or 1802 another American, John Stevens, built a screw-propelled steamboat which he successfully used. But it remained for Ericsson to develop the screw. His first successes were achieved in England in 1837–38, but, getting little encouragement there, he came to the United States in 1839, where his plans were eagerly taken up by Commodore Stockton and other officers of the navy. Through their efforts the United States steamship *Princeton*, of 1000 tons, was built under Ericsson's superintendence. She was the first screw man-of-war built in any country and the first steam-propelled war vessel to have her machinery wholly below the water line. Her almost unqualified success settled the question of the availability of the screw for propulsion, particularly for war vessels. The use of paddle wheels in the merchant service continued for many years, but by 1870 the screw had everywhere triumphed except in the navigation of shoal or interior waters. See SHIPBUILDING; STEAM NAVIGATION.

Bibliography. Barnaby, *Marine Propellers* (New York, 1891); Bennett, *The Monitor and the Navy under Steam* (Boston, 1900); D. W. Taylor, *Speed and Power of Ships* (2 vols., New York, 1910); W. F. Durand, *Resistance and Propulsion of Ships* (3d ed., ib., 1911); Sennitt and Oram, *Marine Steam Engine* (11th ed., ib., 1911); C. H. Peabody, *Propellers* (ib., 1912); C. W. Dyson, *Screw Propellers and Estimation of Power for Propulsion of Ships* (2 vols., ib., 1913); A. E. Seaton, *Manual of Marine Engineering* (17th ed., ib., 1913); J. K. Barton, *Naval Reciprocating Engines and Auxiliary Machinery* (rev. ed., Annapolis, 1914); *Transactions of the Institution of Naval Architects* (London, annual); *Transactions of the Society of Naval Architects and Marine Engineers* (New York, annual); different numbers of both the foregoing annuals contain many important papers on screw propulsion.

SCREW WORM. The larva of a dipterous insect (*Compsomyia macellaria*), parasitic upon mammals and occasionally attacking human beings. The adult fly belongs to the family Sarcophagidæ and is less than half an inch in length, bluish green with metallic reflections and three black stripes upon the thorax. It appears in the summer time and lays a mass of eggs either upon some decaying matter or in an open wound on some animal. Many cases are on record where eggs have been deposited in the nostrils of catarrhal persons sleeping in the open air. The eggs hatch in a very short time, even in a single hour. The larva or maggot is a whitish footless grub, rather slender and quite active, and burrows into the tissues of the affected animal or decaying matter that furnishes it food. It grows rapidly and matures in the course of a week or less, then leaves the wound and enters the ground to transform to pupa. The puparia are brown in color, cylindrical, rounded at the end, and about ⅝ of an inch long. The pupal stage lasts from 9 to 12 days, and there may be many generations in the course of a summer. The screw-worm fly inhabits all of tropical and much of temperate America, extending from Canada to Patagonia. As a direct application for the sores infested with worms a carbolic wash is advised, 1 part of carbolic acid to 30 parts of water. A little glycerin may be added, and a final dressing with pine tar is recommended. Where the nasal passages of human beings are inhabited by the maggots they should promptly be syringed out with a mixture of 1 part of carbolic acid to 200 parts of water. Several fatal cases have been reported. See MYIASIS.

SCRIABINE, skryä'bēn, ALEXANDER (1872–1915). A Russian composer and pianist, born at Moscow. Like many other Russian musicians he was trained for a military career. This he abandoned to enter the Moscow Conservatory, where he was a pupil of Safonov (piano) and Taneiev (composition). After graduation, and winning the gold medal for piano playing (1892), he gained fame as a remarkable pianist on his tours through Europe. But he soon tired of a virtuoso's career, and accepted a professorship in the Moscow Conservatory (1898–1903). After resignation, he devoted his time to composition. His earlier works held out great promise, for they exhibited a spiritual relationship with Chopin, and yet preserved individuality. But about 1900 his views radically changed, and before long he was in the front rank of the modern extremists. In his last completed work, *Prometheus* or *Poem of Fire*, he attempts to prove the fancied relationship between music and color by the introduction of the "color-keyboard." When he died he was engaged on a symphonic poem which was to prove the connection between music, colors, and perfumes. His works include, besides those mentioned, four symphonies, a piano concerto, and piano pieces.

SCRIBE (Lat. *scriba*, from *scribere*, to write). The name given to the members of a class of men in the Jewish synagogue who copied the sacred scriptures and were learned in the law. The Hebrew word (*sōphēr*) is related to the word meaning "book" (*sēpher*), and hence occurs originally for a secretary, as of Baruch (Jer. xxxvi. 26), or of a writer in general (Ps. xlv. 1); it is also used of a certain governmental official, perhaps a muster officer (e.g., 2 Sam. viii. 17). Ezra is described as "the priest, the scribe" in Ezra vii. 11, and as "the scribe [or writer] of the law of the God of heaven" in Ezra vii. 21. (On the sense in which he may have been "the writer of the law," not only as copyist but as editor, see EZRA; PENTATEUCH.) His successors as scribes were probably at first priests like himself, but later the greater number belonged to the laity. (See PHARISEES; SADDUCEES.) That some of the scribes belonged to the Sadducees is distinctly stated in *Sanhedrin*, 90 b. The New Testament gives the earliest full data for this learned caste. The Greek word (*γραμματεύς*, man of letters) is a translation of the Hebrew. Other terms used are more exact in definition of the office; they are called "lawyers" and "teachers of the law." Josephus well describes them as "interpreters of the ancestral laws." The New Testament carefully avoids confusing them with the Pharisees (e.g., Matt. xxiii. 2), for while the great majority of them belonged to this party, the scribes were the learned leaders of the party, those who had approved themselves by education and public acknowledgment as fit teachers. They were the theologians, and, inasmuch as Jewish theology was eminently practical, they were the jurists who interpreted the law for the courts and the casuists who settled individual questions. Their functions have been defined as (1) the theoretical development of the law; (2) the teaching of the law; (3) the giving of legal opinion in court. They enjoyed the unbounded reverence and obedience of the people. Jewish terminology confines the word *Sōphērim* to the pre-Talmudic teachers. Consult Emil Schürer, *Geschichte des jüdischen Volkes* (4th ed., 4 vols., Leipzig, 1901–11; Eng. trans. of the 1st ed., Edinburgh, 1896). For examples of the methods and thought of the scribes, consult Taylor, *Sayings of the Jewish Fathers* (i.e., the *Pirke Aboth*, Cambridge, 1877); Bacher, *Die älteste Terminologie der jüdischen Schriftauslegung* (Leipzig, 1899); R. T. Herford, *Pharisaism* (London, 1912).

SCRIBE, skrēb, (AUGUSTIN) EUGÈNE (1791–1861). A French dramatist, born in Paris. Educated for the law, he turned at 20 to the stage (*Les dervis*, 1811), but he won his first great successes with *Une nuit de la garde nationale* and *Flore et Zéphire* (1816), after which, alone or in collaboration, he poured out an almost unbroken succession of some 400 plays collected in 76 volumes, noteworthy for their interesting plots and light, sparkling dialogues, but most of all for their mastery of the technique of the stage. He essayed every kind of dramatic writing, tragedies, comedies, vaudevilles, opera libretti, collaborating with others and often being little more than editor of others' ideas. He was elected to the Academy in 1834. The best of his plays are, chronologically, *Valérie* (1822), *Le mariage d'argent* (1827), *Betrand et Raton* (1833), *La camaraderie* (1833), *Le verre d'eau* (1840), *Une chaîne* (1841), *Adrienne Lecouvreur* (1849), *Les contes de la reine de Navarre* (1850), *Bataille de dames* (1851), and *Les doigts de fée* (1858). On the last three he worked with Legouvé. The more noted of his libretti are *Fra Diavolo* (1830), *Robert le Diable* (1831), *La Juive* (1835), *Les Huguenots* (1836), *La favorite* (1840), *Le prophète* (1849), *L'Africaine* (1865). Scribe wrote also some insignificant novels. His supremacy lay in the gift of discovering instinctively new and striking theatrical combinations. Scribe's local color is careless, his drawing of character weak, but from him Dumas the Younger, Augier, and above all Sardou, learned that mastery of stagecraft and of the routine of theatrical presentation which has given France for half a century unquestioned leadership in the drama.

Consult: A. E. Scribe, *Œuvres dramatiques* (76 vols., Paris, 1874–85); Ernest Legouvé, *Eugène Scribe* (ib., 1874); C. A. Sainte-Beuve, *Portraits contemporains* (ib., 1881–82); J. J. Weiss, *Le théâtre et les mœurs* (ib., 1889); Ferdinand Brunetière, *Epoques du théâtre français* (ib., 1892); Brander Matthews, in *French Dramatists* (new ed., New York, 1901).

SCRIBLE'RUS, MARTINUS, MEMOIRS OF. A satirical history, ridiculing affectation in learning, by John Arbuthnot (q.v.), first published among Pope's *Works* (1741).

SCRIBLERUS CLUB. A literary club in London formed in 1714 by Swift, to which belonged Arbuthnot, Pope, Gay, Bolingbroke, and others. Its object was to satirize the prevalent false taste in literature; though it was short-lived, we owe to it Arbuthnot's *Martinus Scriblerus*, *Gulliver's Travels*, and indirectly Pope's *Dunciad*.

SCRIB'NER, CHARLES (1821–71). An American publisher. He was born in New York City and educated at the University of New York and at Princeton College, where he graduated in 1840. He studied for the bar, but on account of feeble health did not practice and in 1846 formed a partnership in New York with Isaac D. Baker in the bookselling and publishing business. The firm (or rather Mr. Scribner, for his partner soon died) acquired the works of such authors as Headley, Willis, Donald Mitchell ("Ik Marvel"), Dr. Holland, Dr. McCosh, Dr. Bushnell, etc. In 1857 Charles Welford became a partner, and a specialty was made of the importation of books from England. The partners also entered extensively into the publication of educational books and in 1865 established *Hours at Home*, which in 1870 became *Scribner's Monthly*, and was then published by a separate company, Scribner & Co., with Dr. J. G. Holland and Roswell Smith as part owners. This monthly, under the editorship of Dr. Holland, achieved great popularity and was sold in 1881 and rechristened the *Century Magazine*. On the death of Mr. Scribner the firm was reorganized under the name Scribner, Armstrong & Co.; the name of Charles Scribner's Sons was assumed in 1879, and eight years later the new *Scribner's Magazine* was established. —JOHN BLAIR SCRIBNER (1850–79), the eldest son of Charles Scribner, succeeded his father as head of the firm in 1871.

CHARLES SCRIBNER (1854–), another son, was identified with the firm after 1875. He was born in New York and was educated at Princeton University (A.B., 1875; later A.M.), of which he became a trustee. After taking the

presidency of the incorporated Charles Scribner's Sons he founded *Scribner's Magazine*. He was active in the organization of the American Publishers' Association, of which he was the first president (for three years).

SCRIBNER, Frank Lamson- (1851–). An American agrostologist, born at Cambridgeport, Mass., and educated at the Maine State College of Agriculture. He was connected with Girard College from 1876 to 1884, in 1886 became a special agent for the United States Department of Agriculture, and from 1888 to 1894 was professor of botany in the University of Tennessee. Lamson-Scribner was chief of the division of agrostology in the United States Department of Agriculture from 1894 to 1901, and chief of the Insular Bureau of Agriculture, Philippine Islands, in 1901–04. He had charge of exhibits of the Department of Agriculture at various exhibitions, from that at St. Louis in 1904 to the Panama-Pacific Exposition in 1915. He wrote many valuable papers on the grasses.

SCRIP (corrupted from *script*, Lat. *scriptum*, written paper, book, law, mark, neut. sing. of *scriptus*, p.p. of *scribere*, to write; influenced by popular etymology with *scrip*, wallet, pouch). A certificate of a right to a share or shares in a corporation or of a right to receive a money payment at a future date. When a corporation is being formed, and the regular stock certificates have not been issued, it is customary to give subscribers scrip or "scrip certificates," as they are often called, for payments on account of their subscription to the capital stock, and this scrip may be exchanged later for certificates of stock. Scrip for paid-up subscriptions may be transferred in the same manner as certificates of stock, and the same principles of law apply as to the rights of the parties. Similar scrip certificates are sometimes issued for sums less than the full value of a bond in a corporation, as in rebonding a corporation, which entitle the holder of a sufficient number to aggregate the face of a bond to exchange them for it. Corporations sometimes issue scrip dividends in order to retain surplus earnings as working capital and increase their capital stock.

The term "scrip" was also commonly applied to the certificates issued by State banks which were designed to pass as currency. This scrip was merely a promise to pay the bearer the amount named on the face of the certificate and was similar to United States government greenbacks.

Certificates or orders on stores issued by employers to employees are often called scrip, especially where they are issued in a series of values to correspond with United States currency. Such scrip is, of course, not legal tender. Owing to the belief that payment in scrip often results in oppression of employees a number of States have passed statutes compelling corporations to redeem such scrip on demand in actual money. Consult Victor Morawetz, *Treatise on the Law of Private Corporations* (2d ed., Boston, 1886), and J. T. Morse, *Treatise on the Laws of Banks and Banking* (4th ed., 2 vols., ib., 1903); also see Corporation; Dividend; Money; Stock. For military land warrants sometimes called scrip, see Lands, Public.

SCRIPTO'RES HISTO'RIÆ AUGUS'TÆ. See Augustan History.

SCRIPTO'RES RE'I RUS'TICÆ. See Geoponici.

SCRIP'TURE, Edward Wheeler (1864–). An American psychologist and physician, born at Mason, N. H. He graduated at the College of the City of New York in 1884 and studied at Berlin, Zurich, and Leipzig. In 1892 he became instructor in experimental psychology at Yale, where he was later director of the psychological laboratory (1898) and assistant professor of psychology (1902). In 1903 he returned to Germany to pursue investigations in experimental phonetics. In 1906 he was appointed lecturer at Johns Hopkins, and in 1909 lecturer in psychiatry at Columbia. He wrote: *Thinking, Feeling, and Doing* (1895; 2d ed., 1907); *The New Psychology* (1897; 2d ed., 1905); *Elements of Experimental Phonetics* (1902); *Report on the Construction of a Vowel Organ* (1905); *Researches in Experimental Phonetics* (1906); *Stuttering and Lisping* (1912). Between 1892 and 1902 Scripture edited the annual *Studies from the Yale Psychological Laboratory*.

SCRIV'ENER, Frederick Henry Ambrose (1813–91). An English biblical scholar, born in Bermondsey, London. He took his degree at Cambridge in 1835, and after a number of years' experience as a teacher he became in 1861 rector of St. Gerrans, Cornwall, then vicar of Hendon, and prebendary of Exeter in 1876. Dr. Scrivener was much interested in the textual criticism of the New Testament and was one of the revisers who produced the revision of 1881. His most important service was his *Plain Introduction to the Criticism of the New Testament* (1861; 4th ed., posthumous, ed. by E. Miller, 1894). In addition he edited the Cambridge *Codex Bezæ*, with critical annotations and facsimiles (1864), and *The New Testament in the Original Greek*, according to the text followed in the Authorized Version, together with the changes adopted in the Revised Version (1881). Scrivener's critical principles were those of the old school, marked by reverence for the textus receptus.

SCRIVENER'S PALSY, or Writer's Cramp. See Neurosis; Occupational Diseases.

SCROF'ULA (Lat., dim. of *scrofa*, sow), or Struma. A tuberculous affection manifested by enlargement of the lymph glands and defective nutrition of the tissues generally. The term has had a varied significance at different periods and among different writers on medical subjects, but at the present time scrofula is believed to be merely a manifestation of tuberculosis and to be due entirely to infection and subsequent irritation set up by the specific bacillus of that disease. By many authorities scrofula is looked upon as the pretuberculous stage of consumption. It is certain that individuals with tuberculous adenitis are prone to be attacked by pulmonary tuberculosis, and the presence of these foci are a constant menace. On the other hand many persons of exceptional bodily vigor are met with who in childhood had enlarged glands. Many manifestations of disordered blood conditions formerly grouped as scrofulous are now known to be either tuberculous or due to other definite causes. For example, chronic inflammation of the joints, carious ulceration of the bones, ulcers of the cornea, eczema, and catarrhal states of the mucous membrane of the nose were formerly classed as strumous. Suppurative processes about the teeth, ears, tonsils, or nose are now regarded as the principal etiological factors in many cases of enlarged cervical glands rather than the tubercle bacillus.

The glandular enlargements are most frequently seen in the neck, but all the lymphatic glands of the body may be affected with little or no involvement of other portions of the organism. There is a tendency on the part of these glands to suppurate and form chronic abscesses. Scrofulous children are liable to suffer from chronic bronchitis, diarrhœa, and catarrhal disorders of the nose and throat, and any intercurrent disease such as measles is apt to take a severe form with them.

The treatment of scrofula is chiefly hygienic and comprises fresh air in abundance, warm clothing, and nutritious food. Cod-liver oil and the sirup of the iodide of iron are the most generally beneficial medicines, although iron, strychnine, and arsenic are excellent tonics. Local applications of iodine will help to reduce the enlarged glands. When these break down or suppurate, thorough excision is the only efficient remedy, and the unsightly scars that result from long-continued suppuration may thus be avoided. Extensive surgical dissection, however, is not looked upon with favor.

The old English name for scrofula, "the king's evil," was derived from the belief that the disease could be cured by the royal touch. The faith in its efficacy was widespread, surviving several centuries. Both the English and the French kings practiced this rite, originated, it is said, by Edward the Confessor.

SCROFULOUS OPHTHALMIA. See CONJUNCTIVITIS.

SCROGGS, SIR WILLIAM (c.1623–83). An English jurist, born at Deddington, Oxfordshire. He was educated at Oriel and Pembroke colleges, Oxford, took his B.A. in 1640, studied law, and was admitted to Gray's Inn in 1641. During the Civil War he fought on the Royalist side and was called to the bar in 1653. In 1668 he was assigned as counsel for Sir William Penn in his proposed impeachment trial and in 1676 was knighted and made a justice of the Court of Common Pleas. He was always subservient to the King and made political speeches from the bench. He was appointed Lord Chief Justice in 1678 and was called to the assistance of the Commons in investigating the Popish Plot. (See OATES, TITUS.) In 1679 he presided over the trials of the accused and intimidated all witnesses for the defense, but at the trial of Sir George Wakeman, the Queen's physician, changed tactics and disparaged the evidence of Bedloe and Titus Oates. By this action he lost favor with the more violent part of the Protestant populace and was accused before the Privy Council, but was acquitted. By adjourning the grand jury on June 20 he prevented the indictment of the Duke of York as a Papist recusant. He was impeached by the House of Commons on the eight counts, but Parliament was abruptly dissolved, and he was never tried. The next year he was removed from office, but was granted a pension of £1500 a year. No other judge except Jeffreys has so disgraced the bench. He published *The Practice of Courts-Leet and Courts-Baron* (London, 1701).

SCROOGE, skrōōj, EBENEZER. A harsh, avaricious old man in Dickens's *Christmas Carol.*

SCROPE, GEORGE JULIUS POULETT (1797–1876). An English geologist, born in London and educated at Harrow and at St. John's College, Cambridge. He visited Italy in 1819 to study volcanoes, and after his marriage in 1821, when he took his wife's family name instead of his own, Thomson, traveled in central France and again in Italy and was an eyewitness of the eruption of Vesuvius in October, 1822. With his intimate friend, Sir Charles Lyell, he attacked the prevailing Wernerian theory of volcanic action and advanced the uniformitarian doctrine, insisting at the same time on adherence to the method of actual observation of natural phenomena. Scrope was elected a Liberal member of Parliament in 1833, became known as a defender of free trade, and wrote a large number of political and economic pamphlets. He was also learned in archæology; but his great fame is as a geologist, and he must rank as one of the most logical and clear thinkers among the natural scientists of his day. He wrote: *Geology of the Extinct Volcanoes of Central France* (1827; 2d ed., 1872); *Considerations on Volcanoes* (1828; 2d ed., 1862), a defense of the uniformitarian doctrine in geology; *Principles of Political Economy* (1833; 2d ed., 1874).

SCROPH'ULA'RIA'CEÆ (Neo-Lat. nom. pl., from *Scrophularia*, from Lat. *scrofulæ*, scrofula; so called either because believed to be a remedy for scrofula or because the knots on the roots were supposed to resemble scrofula), THE FIGWORT FAMILY. A large and widely distributed family of dicotyledonous plants embracing about 165 genera and 2700 species, chiefly herbs and subshrubs, and also a few trees (*Paulownia*). This is one of the great families of the Sympetalæ (q.v.), resembling the Labiatæ (q.v.) in the bilabiate character of the flowers, but with capsular fruit. The best-known representatives of the family in North American flora are *Verbascum* (mullein), *Pentstemon, Mimulus, Veronica* (speedwell), *Gerardia, Castilleja* (painted cup), and *Pedicularis* (lousewort). Very common in cultivation are European species of *Antirrhinum* (snapdragon), *Digitalis* (foxglove), and *Linaria* (toadflax).

SCRUB HEN. See MOUND BIRD.

SCRUTIN DE LISTE, skrų'tăn' de lêst (Fr., voting by list). A method of electing members of the French Chamber of Deputies. According to this method of *scrutin de liste* all the Deputies of a given department are elected on a general ticket, each elector voting for the whole list—the method by which presidential electors in the United States are chosen. This method was introduced in 1885 with the view of swamping the minority party and removing the Deputies from the strong pressure of local petty interests. It did not, however, prove satisfactory to the majority, and the arrondissement or single-district method was reëstablished in 1889.

SCUD'DER, HENRY MARTYN (1822–95). An American missionary and minister. He was born at Panditeripo, Ceylon, the son of the Rev. John Scudder, a missionary of the American Board, later of the Dutch Reformed Board. He was graduated at the University of the City of New York in 1840 and Union Theological Seminary in 1843. The following year he went as missionary to Madura, India, and in 1846 to Madras. In 1850 he founded the mission at Arcot for the board of the Dutch Reformed Church. In 1864, his health failing in the climate of India, he returned to the United States and engaged in pastoral work for nearly 20 years. From 1887 to 1889 he was in the mission field in Japan. He published a number of books in the Sanskrit, Tamil, and Telugu languages.

SCUDDER, Horace Elisha (1838–1902). An American author and editor, born in Boston, Mass. He graduated from Williams College in 1858, taught school in New York City, and subsequently, removing to Boston, he devoted himself to literary work. In 1867 he was made editor of the *Riverside Magazine for Young People.* In 1890 he succeeded Thomas Bailey Aldrich as editor of the *Atlantic Monthly.* Although a critic and biographer of recognized ability and an influential man of letters by virtue of his position as editor and literary adviser, he was probably most widely known as a writer of juvenile books, such as *Seven Little People and their Friends* (1862) and the *Bodley Books,* in eight volumes (1875–87). Other titles of his works are: *Life and Letters of David Coit Scudder* (1864); *Stories from my Attic* (1869); *Stories and Romances* (1880); *Noah Webster* ("American Men of Letters," 1882); a well-known *History of the United States* (1884); *Men and Letters* (1887), essays; *George Washington* (1889); *Childhood in Literature and Art* (1894). Doubtless his most important single work is his biography of James Russell Lowell (1901), which presents with fullness, accuracy, and sympathy the chief phases of literary life in New England, with which the biographer himself was throughout his life in touch. Scudder also prepared, with Mrs. Taylor, the *Life and Letters of Bayard Taylor* (1884) and was editor of the "American Commonwealths Series."

SCUDDER, Janet (1873–). An American sculptor, born in Terre Haute, Ind. After studying at the Cincinnati Art Academy under Rebisso and with Lorado Taft in Chicago she worked in Paris under Frederick MacMonnies, whose influence is evident in her technique. With the exception of a three years' sojourn in Florence and short visits to the United States, she resided in Paris. She is known for her medallions and relief portraits and especially for her fountains, usually with childish figures conceived in a playful, sprightly manner. Notable examples of her art are the "Frog Fountain," in the Metropolitan Museum, New York; the "Fighting Boy Fountain," in the Chicago Art Institute; "The Sun Goddess" (1908), a statue on the façade of the Brooklyn Institute Museum; and a portrait relief of Bishop Hare. She is represented in the Luxembourg, Paris, by a series of five portrait medallions. Miss Scudder became a member of the National Sculpture Society and received medals at Chicago in 1893, St. Louis in 1904, and San Francisco in 1915.

SCUDDER, Samuel Hubbard (1837–1911). An American entomologist, born in Boston. He graduated at Williams College in 1857 and at Harvard University in 1862. From 1864 to 1870 he was custodian of the Boston Society of Natural History and in 1880–87 its president. He was an assistant librarian at Harvard from 1879 to 1882 and was attached to the United States Geological Survey from 1886 to 1892. An authority on North American butterflies and orthoptera, he also had a world-wide reputation as an investigator of fossil insects, myriapods, and arachnida. His publications comprise: *Butterflies: Their Structure, Changes, and Life Histories* (1881); *Butterflies of the Eastern United States and Canada* (1889); *The Fossil Insects of North America* (2 vols., 1890); *Index to the Known Fossil Insects of the World* (1891); *Tertiary Rhynchophorous Coleoptera of the United States* (1893); *The Life of a Butterfly* (1893); *Revision of the Orthopteran Group Melanopli* (1897); *Everyday Butterflies* (1899); *Catalogue of the Described Orthoptera of the United States and Canada* (1900); *Adephagous and Clavicorn Coleoptera from the Tertiary Deposits at Florissant, Colorado* (1900); *Index to North American Orthoptera* (1901).

SCUDDER, Vida Dutton (1861–). An American English scholar, born in southern India. She graduated at Smith College in 1884 and after studying at Oxford and in Paris became associate professor of English literature at Wellesley College in 1892 and professor in 1910. Her publications include: *The Life of the Spirit in the Modern English Poets* (1895); *Social Ideals in English Letters* (1898); *Introduction to the Study of English Literature* (1901); *A Listener in Babel* (1903); *The Disciple of a Saint* (1907); *Socialism and Character* (1912); *English Poems* (1915), a compilation; a history of Wellesley College (1915); and, in addition, introductions, etc., to various English classics.

SCUDÉRY, skụ'dā'rē', Georges de (1601–67). A French poet and playwright, born at Havre. He was popular in his time, but is now remembered chiefly through Boileau's satire and as being the brother of the celebrated Madeleine de Scudéry, who published many of her works under his name. By means of assiduous flattery and an adroit polemic against Corneille, Scudéry received from Richelieu in 1643 an appointment as governor of Notre Dame de la Garde, near Marseilles, which he retained until 1658. In 1650 he was elected to the Academy. Scudéry's numerous works include: *La comédie des comédiens* (1634); *La mort de César* (1636); *Arminius* (1643); and a pretentious epic, *Alaric* (1654), which was honored by Boileau's most cutting satire. Consult T. Gautier, *Les grotesques* (Paris, 1844).

SCUDÉRY, Madeleine de (1607–1701). A French novelist, born at Havre. She was left an orphan at six, was well educated by an uncle, and, with her scapegrace brother Georges, went to Paris in 1630, where her wit and good sense soon won her high rank in the brilliant society of the Hôtel de Rambouillet. Her early writing was done under the name of her brother Georges, who seems to have collaborated with her in battle scenes, general plan, prefaces, and dedications and is said in days of need to have kept his sister under lock to secure steady production. She soon became prominent in society, and her salon was much frequented. Her novels are: *Ibrahim* (4 vols., 1641); *Artamène ou le grand Cyrus* (10 vols., 1649–53); *Clélie* (10 vols., 1654–60); *Almahide* (1660); *Mathilde* (1667). For a generation after its publication the *Grand Cyrus,* which in classic guise depicted French society, was known and studied in all circles that aspired to literary refinement. The longest novel of the world was also the most profitable of the period. The *Grand Cyrus* is not a story, but a framework for conversation, reflection, analytic portraiture. She painted French aristocracy in the *Grand Cyrus* and the bourgeoisie of the new culture in *Clélie.* The characters of her stories were easily recognized as portraits of prominent persons of the day. Her later novels, Spanish and Italian in scene, are insignificant, though regarded as novels they are her best. She tactfully yielded to the

literary ideals of the school of 1660, voiced in Boileau's *Dialogue des héros*, and passed the last 40 years of an honored life with the common esteem of people as different in temper and ideals as Racine and La Fontaine, Condé and Madame de Sévigné. Her *Correspondance* is of much literary interest. Consult: C. A. Sainte-Beuve, *Causeries du lundi*, vol. iv (Paris, 1857–62); Rathery and Boutron, *Mademoiselle de Scudéry: Sa vie et sa correspondance* (ib., 1873); Victor Cousin, *La société française au 17me siècle* (6th ed., 2 vols., ib., 1886); André Le Breton, *Le roman au XVIIème siècle* (ib., 1890); A. G. Mason, *The Women of the French Salons* (New York, 1891). Summaries of the stories and keys to the characters may be found in Heinrich Körting, *Geschichte des französischen Romans im 17ten Jahrhundert* (2d ed., Oppeln, 1891).

SCULLING. See ROWING, and Plate of LACROSSE AND SCULLING.

SCUL'PIN (of unknown etymology), or SEA ROBIN. One of the small, strange, spiny marine fishes of the family Cottidæ (q.v.), about 250 species of which inhabit rocky shores in northern regions and are known as miller's thumbs, dragonets, father lashers, Irish lords (qq.v.); while the name is given in California to certain fishes of the related family Scorpænidæ. Some, like the sea raven (q.v.), are large and brilliant, but most of them are mottled in browns,

A SCULPIN (*Hemitripterus americanus*).

yellows, and blacks. They are grotesque in shape and resemble bullhead catfish with a warted body, many fleshy appendages, and the fins grotesquely elongated and fluttering with rags. These fishes lurk about rocky and weedy places, seeking small animals for food, and are a source of annoyance to fishermen, whose bait they steal. They render service as scavengers about fish-curing stations and furnish an abundance of food for larger fishes. Consult Theodore Gill, in *Smithsonian Miscellaneous Collections*, vol. ii (Washington, 1904).

SCULP'TURE (Lat. *sculptura*, from *sculpere*, to carve, cut out of stone). That branch of the fine arts which represents objects of nature or of the imagination in solid form, i.e., in three dimensions, as distinguished from painting (q.v.), which uses but two dimensions, or architecture (q.v.), which beautifies utilitarian work. There are two forms of sculpture—sculpture in the round, or free standing sculpture, and relief sculpture, in which the figures are attached to the solid surface or background. The chief varieties of sculpture in the round are usually busts, statues, and groups, and there are three varieties of relief—high, middle, and low. (See RELIEF SCULPTURE.) In all ages the chief subject of sculpture has been the human figure, whether nude or draped.

Processes and Materials. The processes used in sculpture, each of which involves the practice of a separate art, are of radically different character. There is, first, carving with the sharp tool in a substance sufficiently solid and hard to resist the tool, such as stone of different kinds, ivory in all ages or wherever a little luxury was possible (and, as a substitute for ivory, bone), and wood. These are the more common materials, but there is nothing hard which has not been used for sculpture. The statues of the ancient Egyptians in granite, basalt, and diorcite, in every size from colossi to figurines, are famous. There are statuettes in rock crystal; Chinese carvings in jade are famous; cameos in antiquity and in modern times are wrought in onyx, and intaglios or incised sculptures are cut in chalcedony, sard, and amethyst.

Artistic form is also produced by means of modeling in soft material; wax is peculiarly susceptible of free handling and will retain perfectly the form given to it; it has been employed, therefore, in statuettes, busts, and medallions at many epochs in the history of art. Moreover, as it will receive and retain coloring very perfectly, it has been a common medium for polychromatic sculpture. Clay, the material of ceramic art, is equally susceptible of artistic treatment when no intention exists of fixing its form by heat. It is used in this way by the artist for the original small study as well as for modeling the whole figure or group to be produced. If the clay be of a kind good for the purposes of the potter, the piece as originally modeled may be fired and produce a terra-cotta bust or statuette. Such sculpture in terra cotta (q.v.) is identified with some splendid periods of art.

The metals are used in two ways: first, they are cast, and for the purposes of the artist in cast metal the plastic materials mentioned in the last paragraph above are eminently fitted. The mold for a casting in bronze or silver can be made directly or at one remove, from the clay model; and this mold may suffice for one or for many castings, according to the system adopted. These castings may be finished by hand; the file, the chasing tool, even the cutting edge of what is really a chisel may all be called into use to perfect the forms at the sculptor's will. In very recent times some of the great European iron foundries have even attempted artistic work in cast iron. Bronze is by far the most common material for this purpose and has lent itself for thousands of years to the work of the sculptor on a very large scale and also in minute pieces of ornamentation. Silver and gold, and in modern times tin, either pure or slightly hardened by the admixture of another metal, are materials constantly in use. The artistic goldsmith work for ecclesiastic and civil display has always been a fruitful field for the sculptor. See METAL WORK; BRONZE; FOUNDING.

Metal may also be used in a quasi-plastic way, for the great tenacity of copper and the somewhat less but still available toughness and expansibility of bronze, together with the perfect ease with which the precious metals can be manipulated in this way, have always induced the artist to work in thin plates, embossing them by hammering from the wrong side and then chasing and perhaps engraving the face so as to modify the original embossing. (See REPOUSSÉE.) This was done on a very large scale

in Greek chryselephantine statues and is still practiced on colossal bronze statues, which are commonly made of plates of bronze hammered into reliefs, and also in producing small decorative vessels.

Methods. A model of clay is commonly used in all works of sculpture. In works of cast metal (see FOUNDING) the sculptor's activity, except the final chiseling of the metal, ends with the model from which the statue is made. In marbles the Greeks, indeed, are reputed to have worked sometimes without one, and Michelangelo seems to have used only a small wax model or a sketch. The usual modern process is to make a preliminary sketch of wax or clay on a small scale. An iron skeleton of about the proportions of the intended statue is then set upon a stand with a movable top, enabling the sculptor to work conveniently on all sides. Upon this skeleton modeling clay, moistened by water or stearin and glycerin, is laid, and the sculptor models the figure with bone and wooden tools. When the model is finished piece molds of plaster are applied from which the statue is cast in plaster.

The conversion of this model into stone is a more complicated process. The model and the block to be carved are placed upon similar pedestals near each other, and by aid of a mechanical device, called the pointing machine, holes are drilled into the marble of almost the same depth as the depressions upon the surface of the model. The correspondence between the model and the block was formerly indicated by a series of marks made upon each, which enabled the assistant to locate the holes to be drilled. But now a more exact device is used, consisting of a T-shaped instrument by means of which the three most prominent points of the model are fixed upon the stone, and from these points others are gained by an elaborate similar process of triangulation. From the holes thus drilled a trained stonecutter (*scarpellino*) rough-hews the stone, leaving only the completion for the sculptor. This practice accounts for the general lack of skill in marble carving by the modern sculptor.

History. It is the purpose of this article to treat the development of modern as distinguished from ancient sculpture. That of the Oriental peoples, whose art is principally decorative, has been treated under such heads as CHINESE ART, JAPANESE ART, INDIAN ART; that of the ancient peoples whose art is not connected with the general development under EGYPTIAN, BABYLONIAN, and ASSYRIAN ART. Classic sculpture, which under the Greeks attained its most perfect development, is treated under GREEK ART and ROMAN ART. That of the Middle Ages, which is entirely dependent upon architecture, is best treated under the chief mediæval epochs. (See CHRISTIAN, ROMANESQUE, and GOTHIC ART.) With the Italian Renaissance modern sculpture begins. With its emancipation from architecture the individual artist becomes of importance. It will be found convenient to treat this part of the subject under the two headings, *The Renaissance* and *Modern Sculpture*. The first includes the great revival of the fifteenth and sixteenth centuries, to which may be appended the mannered art of the seventeenth and eighteenth centuries as emanating from the same source. With the nineteenth century begins modern art par excellence, achieving results most radically different from the ancient period.

THE RENAISSANCE

First Revival in Italy. The chief revival of the art of sculpture, marking, indeed, the origin of Italian and through it of modern sculpture, occurred in Italy during the thirteenth century. There was a general revival in the peninsula, following classic models, with southern Italy, Rome, and Pisa as the chief centres, of which only the latter was destined to prevail. (See GOTHIC ART.) Here the father of the art was Nicola Pisano (c.1210–c.1278). In form and in subject his art is a continuation of Tuscan Romanesque, but differing from it in that its inspiration was antique art. His models were late Roman reliefs and sarcophagi, which he imitated not only in figures and in style, but even in technique, as, e.g., in the conspicuous use of the drill. The expression of the faces is serious and noble, and the treatment of the nude is surprisingly good, but the draperies are heavy and the composition is often overcrowded. Of his pupils Arnolfo di Cambio, chiefly celebrated as an architect, and Guglielmo d' Agnolo followed his classical tendencies, but his son Giovanni Pisano (died c.1314) gradually evolved a style the chief characteristics of which were naturalism and dramatic, even extravagant action. It was, indeed, an independent version of the Gothic style, with its strong religious and allegorical elements, that he introduced into Italy. His influence was decisive upon Italian art. Independent schools of sculpture arose at Florence and Siena, and branches of the Pisan school were established at Milan and Naples during the fourteenth century.

At Florence Andrea Pisano's (died c.1348) reliefs on Giotto's campanile and other works show a higher development of symbolism, more perfect technique, simpler composition, and more restrained action than Giovanni's. He perfected the hitherto crude art of casting bronze in relief to the highest extent attained before the Renaissance. Andrea's sons found employment at Pisa, but his successor at Florence was Andrea Orcagna (died 1368), whose work is in some respects an advance upon that of Andrea Pisano—more picturesque and dramatic in style, richer in composition, and grander in form, but inferior in detail and with less sense for the significant. The Sienese school was inferior to the Florentine during this epoch, being rather picturesque and narrative in character, without a true understanding of form. Its chief works are the sculptures on the façades of the cathedrals at Siena and Orvieto, the latter probably designed by Maitani, and the most important work of its kind in Italy.

Early Renaissance. The Renaissance (q.v.) opened a new era in sculpture. The sources of inspiration were the same as in painting, viz., the study of nature and of the antique, with this difference, that in sculpture the influence of the antique was stronger, owing to the survival of antique statuary. But although the antique from the beginning made itself strongly felt in decoration, and furnished motives, sometimes even figures, to the sculptor, it did not materially influence the general treatment, line, or modeling, the prevailing characteristic of which, during the early Renaissance, was a healthy naturalism. In relief, as in statuary, the highest development was attained and the use of color and perspective commonly were adopted. Marble backgrounds, when not sculptured, were painted

blue; other parts, like hair and angels' wings, were gilded, as were usually bronzes, while terra cottas were colored to rival painting itself. The great centre of sculpture from which all influences radiated was Florence.

The beginnings of the new movement appeared towards the end of the fourteenth century, but the first Renaissance achieved a complete victory in the works of Ghiberti, Donatello, and Luca della Robbia—the principal figures in the first half of the fifteenth century. Lorenzo Ghiberti (1378–1455) was essentially a goldsmith, achieving his triumphs in this art and in bronze relief, in which he attained the highest perfection. His first doors of the Florentine baptistery, compared with Andrea Pisano's, show the advance of the new art in naturalistic treatment, beauty of form and grace of draperies, richer composition and skill in relief; his famous "Paradise Portals" show besides a masterly treatment of sculptural perspective, in which he surpassed all contemporaries. See Plate under GHIBERTI, and the articles on the artists mentioned.

The greatest sculptor of the early Renaissance, and, indeed, one of the greatest of all times, was Donatello (c.1386–1466). Although leavened by the antique, his art was realism of the highest type; he sought the characteristic, even at the sacrifice of beauty. He understood perfectly the handling of the materials, achieving the highest effects, whether in marble or in bronze, and he was equally good in statuary or relief. His art dominated Italian sculpture till the advent of Michelangelo. Michelozzo (1396–1472), his associate, excelled as a bronze founder, but shows in his own designs a talent sufficiently mediocre. The art of Luca della Robbia (1399–1482) was midway between that of Donatello and Ghiberti, uniting charm of color with beauty of form. His best-known achievements are in the celebrated terra-cotta ware which he invented. (See ROBBIA, DELLA.) His nephew Andrea della Robbia (1437–1528) introduced terra cottas into the smaller towns of Italy, and at best produced graceful and charming works. Other members of the family carried on the art for a century and a half.

During the second half of the fifteenth century the demand for sculpture continued in the main ecclesiastical and gave occasion for numbers of tombs, pulpits, tabernacles, and friezes. Andrea del Verrocchio (1435–88), originally a goldsmith, who worked chiefly in bronze, produced powerful art with a very individual sense of beauty. His statue of Bartolommeo Colleoni at Venice is the finest equestrian statue of the Renaissance, if not of modern times. Another bronze worker of importance was Antonio Pollaiuolo (1429–98), whose art, like Verrocchio's, was angular and realistic, but was without his sense of beauty. The marble workers of the later fifteenth century sought to combine beauty of form and charm of presentation with Donatello's naturalism. Desiderio da Settignano (1428–64) added elegance and harmony to Donatello's realism and did decorative work of the highest order. Bernardo Rossellino (1409–64), in his tomb of Leonardo Bruni (Santa Croce), created a model for the early Renaissance. Antonio Rossellino (1427–78), his younger brother, shows rather the influence of Desiderio in the delicacy and charm of his work. Benedetto da Majano (1442–97), the celebrated architect, continued the same tendencies as a sculptor, and in the pulpit at Santa Croce, the most beautiful of the Renaissance, he solved the problem of perspective in marble carving. Mino da Fiesole's (1431–84) work possessed a certain naïveté and decorative quality, but was often mannered.

At Siena there was an independent school, the chief characteristics of which were sentimental tendencies and elaborate architectural decoration. A typical Sienese artist was Lorenzo Vecchietta (died 1480). The greatest master of the school, Jacopo della Quercia (c.1369–1438), represents the transition from the Gothic. Neglecting form and detail, he seeks to give his figures life exhibited in motion. Under Quercia's influence stood Niccolò dell' Arca (1414–94) at Bologna, and he in turn gave impulse to Guido Mazzoni (1450–1518) of Modena, the principal sculptor, during this period, of painted terra-cotta groups. He represented with great realism the Italian peasant as participant in sacred story.

At Padua the influence of Donatello was paramount. In Lombardy, too, the influence came from Florence, with the activity of Michelozzo at Milan, though this school was somewhat influenced by neighboring German art. Its chief characteristics were an almost overluxurious decoration, executed, however, in a crisp and vigorous style. Its chief monuments are the sculptures of the cathedral at Milan, of the Certosa at Pavia, and of the Colleoni Chapel at Bergamo, and the principal masters are Omodeo (died 1522), Cristoforo Solari (died 1523), Caradossa (died 1527), and Busti (died 1548). The influence of Milan prevailed throughout the northern part of Italy as far east as Verona.

In Venice sculpture was closely united with architecture. It was richly decorative in character and luxuriant in form, being softer and more sensuous than the Milanese or Florentine. Gothic forms lingered longer here than elsewhere, as is shown in the beautiful Porta della Carta (1438–43) of the Ducal Palace, by Bartolommeo Buon, representing the transition to the Renaissance forms. The later work of Antonio Rizzio, however, belongs to the best that the early Renaissance has produced. Pietro Lombardo (died 1515) is thoroughly Renaissance in style and characteristically Venetian in ornament, as may be specially seen in the decorations of Santa Maria dei Miracoli. His sons Tullio and Pietro, together with Alessandro Leopardi (died c.1522), sought inspiration in Greek monuments instead of the customary Roman and achieved fine decorative results.

High Renaissance (sixteenth century). Sculpture now became freer than at any previous period, being no longer dependent upon architecture, as in the Gothic epoch, or even upon decoration, as in the fifteenth century. It was allotted a more important place by architecture than previously; indeed, architecture itself became sculpturesque, a framing for statues or monuments. There was a tendency towards colossal forms, and at first a deeper study of the antique, which produced a monumental style and universal type, but this soon degenerated into a mannered imitation of the great masters who acquired it.

Florence was still the chief centre. Andrea Sansovino (1460–1529), a follower of Verrocchio, possessed beauty of form, but lacked originality, and his later statues are mannered. The greatest of the Florentines, and indeed the greatest sculptor in modern art, was Michelangelo, "the man of destiny." To a profound knowledge of

anatomy and skill in line he added an equal technical ability in the treatment of the marble. Using the action of the human figure as expressive of emotion, he developed a style which was the culmination of that of Donatello, Quercia, and Signorelli. Its chief characteristics were gigantic, highly developed forms combined with intense dramatic action, and these qualities, which the Italians call *terribilità*, dominated the sculpture of the remaining sixteenth century, the seventeenth, and even eighteenth. Not possessing his genius and impelled by the demand for rapid production, his followers produced works without real feeling and mannered in character. His pupils and followers show no particular individuality. Bandinelli (1488–1560) was a mere imitator of Michelangelo, and his pupil Ammanati (1511–92) was even worse. Brilliant exceptions to the general mediocrity were the Florentine bronze sculptors Benvenuto Cellini (1500–71), one of the world's greatest goldsmiths, and the Fleming Giovanni Bologna, who excelled in composition and movement.

In Venice the chief master was the Florentine Jacopo Sansovino (1486–1570), a pupil of Andrea Sansovino, who modified his style to suit the rich decorative effects demanded there. His pupils, like Girolamo Campagna, produced good work after the rest of Italy had sunk into mannerism. But during the two following centuries came the same decline.

Sculpture of the seventeenth century in Italy was dominated by Giovanni Lorenzo Bernini (1598–1680), active chiefly at Rome. He was a most skillful technician, but in his exaggerated works failed to recognize the limitations of sculpture. His followers, chief of whom were Algardi and Maderna, lost even the capacity for great ideas and were hopelessly mannered and extravagant.

French Renaissance. During the fifteenth and still more during the sixteenth century the Italian influence spread throughout Europe, propagated at first by Italian sculptors who were summoned abroad. A Renaissance of sculpture had already appeared, for such was surely the development of sculpture during the late Gothic period, especially during the fifteenth century, in France and the Netherlands. Its chief characteristic was an acute and highly developed yet pictorial naturalism. Claux Sluter, a Hollander, chiefly active at Dijon, was its foremost representative, and the greatest French sculptor of the period, Michel Colombe, is said to have been his pupil. Italian influence was greatly strengthened by the expedition of Charles VIII to Italy, especially through Perréal, the King's director of art. The principal school of the period was at Tours, and its greatest master was Michel Colombe (c.1431–1512), whose work compares favorably with the best of the early Italian Renaissance. At best it combines Italian grace and beauty of form with the delightful naturalism of the native school.

In the early sixteenth century the patronage of Francis I greatly promoted the Italian influence, which was stronger in the south than in the north. During the first half of the century decorations like those in the cloisters of Saint-Martin at Tours and the choir screen at Chartres rival the most delicate Florentine decoration, and during the latter half of the sixteenth century figure sculpture attained its highest development in the persons of Bontemps, Goujon, and Pilon. Pierre Bontemps, who flourished about the middle of the century, represents the native influence in its powerful naturalism, while Jean Goujon (c.1520–c.1568), perhaps the greatest French sculptor of the Renaissance, shows the native style transformed by Italian grace and beauty. He was without a rival in his wonderful manner of filling in architectural space and portrayed the female figure in beautiful rhythmic lines. Germain Pilon (died ?1590) possessed a more vigorous talent, being a fine anatomist and a man of science. He was only gradually influenced by the Italian style, which, however, he finally adopted to the extent of occasional mannerism. His best pupil was Prieur (died 1611). All of these men worked under royal patronage and in close association with the King's architects, whence the excellent decorative character of their work. Outside of Paris local schools at Toulouse, Troyes, and elsewhere show the same tendencies.

In the early seventeenth century the Italian influence increased with the stay in Italy of men like Guillain and Sarrazin. This influence, however, had changed to the mannered forms of the baroque, although the Frenchmen tempered it by a certain grace which was national in character. Under Louis XIV sculpture became pompous and exaggerated, retaining good decorative qualities. The greatest genius of the century was Pierre Puget (1622–94), a native of Marseilles, whose Italian training shows the influence of Bernini and Algardi. Though often exaggerated in form, his work is of great technical ability and full of Provençal fire. At court the pompous Girardon (1628–1715) was representative sculptor and the head of a large school. Coysevox (1640–1720) was more original and measured, and his pupils, the brothers Coustou, in the graceful character of their work foreshadow the eighteenth century.

During the eighteenth century exaggerated form gave place to courtly grace and delicate sentiment, and sculptors occupied themselves with the rendition of individuality and the technical treatment of marble. A healthy realism, manifesting itself chiefly in portraiture, gradually developed. Lemoyne designed pompous monuments and better busts; Bouchardon (died 1762) is more measured in his characteristic busts and his charming antiques; and Pigalle (died 1785) united great technical ability with a brilliant temperament. Jacques Caffiéri and Augustin Pajou (died 1809) are chiefly known for their fine and graceful busts; Claude Michel (1738–1814), called Clodion, executed figurines of a light and charming character, chiefly in terra cotta. All that was best in French sculpture of the eighteenth century culminated in Jean Antoine Houdon (1741–1828), a pupil of Lemoyne and Pigalle, who, though capable of creating beautiful and ideal works, was chiefly active as a portraitist in an art essentially realistic and modern.

German Renaissance. In Germany the emancipation of sculpture from the Gothic was very slow; throughout the fifteenth century the influence of the Gothic forms lingered. As its course of development followed that of painting, German sculpture was pictorial in character, richly colored and gilded, and in elaborate Gothic framing. It was practiced chiefly in large carved altarpieces and religious figures. Unlike the Italian, German sculpture lacked the sense of beauty and form. Draperies were not treated to show the outline of the figure, but rather to

conceal it. But German sculpture was all the more naturalistic because of the absence of classic influence, and its most pleasing manifestation was the expression and delineation of character in the human face. Even when, in the sixteenth century, the Italian influence entered Germany, it was less important than in other countries. The German schools are divided into two groups: the South German, which is more monumental in character, reflecting the Italian influence; and the North German, which reflected the influence of the Netherlands.

The most important school was the Franconian, with its chief centre at Nuremberg. The first sculptor of any prominence there was the well-known painter Michael Wohlgemuth (1434–1519), who designed a large number of wooden altarpieces, the style of which resembles that of his paintings. Veit Stoss (1440–1533), the principal wood carver of the school, executed altarpieces more plastic in character and dramatic in action; although his figures were highly individual, the composition was restless, overcrowded, and overdramatic. Contemporary with these masters lived a number of anonymous artists, whose work, like "Our Lady of Sorrows" in the Germanic Museum, shows great ability. The foremost stonecutter of the Nuremberg school was Adam Krafft (c.1450–1507), whose style is simpler and more dignified than that of Stoss, deeper in feeling, more realistic and careful in execution. The chief bronze founder of the German Renaissance was Peter Vischer (c.1455–1529). In his works, like the shrine of St. Sebaldus and the statues of the monument of Maximilian at Innsbruck, the Italian Renaissance first appears in German sculpture. The same influence appears more prominently in the work of his sons, Hermann and Peter, who assisted him.

In Nether Franconia there were a number of important sculptors, like the master of the Creglingen altar (1487), whose measured and serious work shows some Italian influence, as does to a greater extent that of Tilman Riemenschneider (?1468–1531), the chief master of the Würzburg school. The work of the Swabian school is characterized by a greater grace and charm, as may be especially seen in the choir stalls of the minster at Ulm, carved by Jörg Syrlin. This is even more the case in Bavaria and Tirol, where the chief master, Michael Pacher (died 1498), displays a German naturalism modified by a highly developed sense of the beautiful, much like Italian work.

In middle and northern Germany the prevailing influence radiated from the Netherlands, producing an art which was pictorial in execution and crowded in composition. The stone monuments of the middle Rhine have perished, but along the lower Rhine and in northern Germany wood carving was very generally practiced, the finest surviving monument being the beautiful carved altar of Schleswig (1515–21) by Hans Brüggemann. Its powerful naturalism and high dramatic action show distinct Dutch influence. Fine stone carving was also done in the mining district of Saxony, near the Bohemian boundary, as may be seen in the beautiful portal of the church of Annaberg.

After about 1530 foreign artists were mostly employed—Italians in the south, Netherlanders in the north. The Thirty Years' War put an end to all artistic activity. The greatest German artist of the baroque period, during which foreign artists were chiefly employed, was Andreas Schlüter (1664–1714), active chiefly at Berlin, whose work shows a commingling of Italian baroque and Netherlandish influence. Raphael Donner (1693–1741) held a similar position in Austria, except that his works exhibit more study of nature and the antique.

Other Countries. The sculptures of the Netherlands were largely destroyed during the Reformation. Its early renaissance in the works of Claux Sluter and others has already been noticed. This naturalistic art dominated the Netherlands during the fifteenth century, and until the sixteenth, when the Italian influence appeared. It manifested itself chiefly in the charming decorations, but, although good work was produced, no individual artists of prominence are recorded, except Jean Boulogne, whose art was practically Italian. In the seventeenth century the school of Antwerp came into prominence. François Duquesnoy (1594–1643), the chief master, has been compared to Rubens, and in spite of his training in the Italian baroque he maintained some dignity of style. His pupil, Artus Quellinus (1609–68), active chiefly in Amsterdam, had a wide influence in Germany. In the eighteenth century sculpture in the Netherlands declined, the Flemish school showing increasing mannerism, while the Dutch was more naturalistic.

To the early Netherlandish influence prevailing in Spain succeeded, in the fifteenth century, a transitional, semi-Italian style. Italian artists continued to be summoned to Spain, and in the sixteenth century a more monumental style, the chief characteristic of which was richness of decoration, arose. Sculpture found wide employment in rich altars, retables, and reredoses. The best-known representative of this high Renaissance is Berruguete (died 1561), whose fantastic style was modeled upon Michelangelo. Similarly mannered were the brothers Leoni, chief sculptors to Philip II. In the seventeenth century a realistic reaction, corresponding to that in painting, originated in Andalusia (Seville), the chief representative of which was Martínez Montañes, who sought above all to express energy and character. His pupil Alonso Cano (1601–67) continued this style in works of an ascetic religious character. In the eighteenth century mannerism reigned supreme.

Throughout the Renaissance epoch England depended almost entirely upon importation of Netherlanders during the fifteenth century and of Italians during the sixteenth. During the two following centuries the only names of note were Nicholas Stone, who was associated with the architect Inigo Jones, and Grinling Gibbons (died 1721), a Dutchman associated with Christopher Wren.

MODERN SCULPTURE

The reaction upon the extravagances in form and feeling of baroque sculpture took the form of a return to the simple and noble manner of the ancients. The antique was followed more closely than ever before, as well in subject as in form. Sculpture lost its religious character and became private and aristocratic. With the increasing prominence of national and democratic movements, a demand for greater naturalism arose. Finally, in the latter half of the nineteenth century, sculpture began to occupy itself with the actualities of life. The earliest leader of the classical reaction was Antonio Canova

(1757–1822), whose life work was done at Rome, where he came under the influence of the movement originated by Winckelmann. His art is a transition from the baroque to the more purely classical spirit of Bertel Thorvaldsen (1770–1844). A Dane by birth, but a Roman by adoption, the latter was the greatest representative of the classic in modern art. As Canova had excelled in statuary, so Thorvaldsen excelled in relief, using the purest Greek work as his models and producing the highest class of work possible to one using the dead forms of a past epoch. From Rome the influence of these men radiated throughout Europe, transforming sculpture.

France. The chief representatives of the classical school in France were Antoine Denis Chaudet (died 1810), whose best works were of an ideal character, and François Joseph Bosio (died 1845) and James Pradier (1792–1862), who attained a higher technical perfection by a tendency towards sensuous treatment. Some of Pradier's many pupils manifested within their classical forms a tendency towards naturalism.

Corresponding with the Romantic reaction in painting there came a similar tendency in sculpture. Its chief representative was Préault (1809–79), but neither he nor his followers made technical improvements on the Classicists. A more important form of the reaction was naturalism, which found its chief early representative in David d'Angers (1788–1856), whose works are a transition from classicism to modern realism. The most prominent figure during the first half of the nineteenth century was François Rude (1784–1855), who also began as a Classicist, but soon yielded to an innate naturalism. His "Departure of the Volunteers in 1795" on the Arch of Triumph in Paris was epoch-making in modern sculpture. The same naturalism was applied to the representation of wild animals, the savage strength and character of which was presented with great force by Antoine Louis Barye (1795–1875) and by his pupil Auguste Nicolas Cain (1822–94).

Classical and Naturalistic tendencies run parallel in the second half of the nineteenth century with an increasing influence of naturalism. Among the more strictly classical are men like Henri Chapu (1833–91), who worked freely in the Greek spirit, Dumont, Jouffroy, and Perraud. In academic circles the Romantic and Naturalistic tendencies gained great ground, and the Renaissance rather than antiquity became the source of inspiration in the well-balanced and technically faultless compositions of men like Paul Dubois (1829–1905). Other important representatives are the clever and versatile Falguière (1831–1900); Antonin Mercié (1845–), whose art is graceful and refined; the fantastic but more highly individual Saint-Marceaux (1845–); Bartholdi (1834–1904), sculptor of the Liberty Statue in New York harbor; and Ernest Barrias (1841–1905), whose work is characterized by largeness of treatment.

Jean Baptiste Carpeaux (1827–75), a pupil of Rude, carried his master's naturalism to its logical conclusion in work characterized by great abandon and dramatic power and by a sensuality reminding of Rubens. Emmanuel Frémiet (1824–1910), combining the art of his uncle Rude with that of Barye, was especially successful in equestrian monuments and genre subjects. But the greatest works of all have been produced by the later Naturalists. The two chief leaders were Jules Dalou (1838–1902) and Auguste Rodin (1840–), who headed the sculptors in the secession of 1890, the salon of Champs de Mars. The former is a Realist on the order of Carpeaux, refined by academic training, who endeavors to maintain an historical continuity with French art of the time of Louis XIV. Rodin is probably the greatest sculptor of the century. Scorning all traditions and following nature alone, he has produced dignified though melancholy statues, which will bear comparison with the best work of all times. A very remarkable individuality is Bartholomé (1848–), a painter without training in sculpture, who has produced masterpieces of the first order, especially in funerary sculpture. In sculpture, even more than in painting, Paris has become the school of Europe. The minor arts of sculpture have also been most highly developed. Chaplain and Roty have brought the art of engraving medals to high perfection, and great success in medals as in statuettes has been achieved by Théodore Rivière.

Belgium. Sculpture in Belgium is essentially like that in France. The Realistic movement began in 1830, producing such men as Fraikin (1819–93), Constantin Meunier (1831–1905), who with fine realism has represented the dignity of labor in a manner reminiscent of Millet, and Lambeaux (1852–1908), who delights in fantastic Rubens-like figures. The naturalism of Jules Lagaë (1862–) and Jacques Lalaing (1858–) is even more pronounced, and Charles van der Stappen may be said to hold the balance between the two.

Great Britain. The first representative of the classical reaction in England was John Flaxman (1755–1826), who with remarkable purity and fine idealism excelled in designs and relief, his larger sculptural work being often deficient in technique. He was followed by a long series of men much inferior to him, like Westmacott, Chantrey, Bailey, and especially John Gibson (died 1866), the most important of the group. Their work was cold and elegant and often deficient in technique. A new spirit, the reaction against cold classicism, came with Alfred Stevens (1818–75), who, although a pupil of Thorvaldsen, brought life and personal feeling into English sculpture. His Wellington monument in St. Paul's Cathedral was epoch-making. The chief representatives of the transition from the classical to the later naturalism were John Henry Foley (1818–74), J. Edgar Boehm (1834–90), and Thomas Woolner (1825–92).

The greatest change, however, has come over British sculpture since 1870. Among the first to show the new tendency were some of the great painters, especially George F. Watts (1817–1904), who ranks equally high as a sculptor. His work is original in conception, rich in modeling, and broad in treatment. Lord Leighton (1830–96) was more advanced in his few sculptural efforts than in his painting. The change, however, is mainly due to French influence, especially to Jules Dalou, who was for some years professor in the South Kensington schools. His teachings inculcated real structure and movement as the basis of a sound and wholesome naturalism. Among those influenced by the French school are Henry H. Armstead (1828–1905), George Simonds (1844–), and Sir Thomas Brock (1847–), whose work is well balanced and excels in line. Hamo Thornycroft's (1850–) art, though modern, represents a kind of Greek reaction against the "Fleshy school"

of Carpeaux. Edward Onslow Ford (1852–1901) did refined and graceful work; W. S. Frith, Dalou's pupil, exercised great influence as a teacher in the Lambeth Art Schools. The greatest influence of the present day in English sculpture is Alfred Gilbert (1854–), a very versatile artist, treating with high poetic imagination subjects both dignified and light. He has made much use of goldsmith's work in his art, and his example has been followed by many of the younger artists. Other important sculptors of recent years are Harry Bates (1850–99), Sir George Frampton (1860–), a decorative sculptor, the animal sculptors Robert Stark and John M. Swan (1847–1910), and Frederick W. Pomeroy, who has made fine statuettes.

Germany. The first German Classicist of importance was Johann Heinrich Dannecker (1758–1841), who established the Stuttgart school. In Berlin Johann Gottfried Schadow (1764–1850), although a Classicist, and superior where the ideal element was involved, began the introduction of historical sculpture. His principal followers were his son Rudolf Schadow (died 1822), Christian Friedrich Tieck (1776–1851), and Christian Rauch (1777–1857), the greatest sculptor of the German historical school. Though his sense of form was refined by the antique, Rauch's art was in the main Naturalistic and faithful to historical detail. Among his followers were Drake, Bläser, Schievelbein, Kiss, famous for his animals in bronze, Siemering, Encke, and Schweinitz. The tendency of the Berlin school was towards historical and Naturalistic sculpture. At Dresden Ernst Rietschel (1804–61), the best of Rauch's pupils, continued his master's style, with a slight tinge of romanticism. Ernst Hähnel (1811–91) represents rather the transition from classical to Romantic style, while Johannes Schilling (1828–1910), Rietschel's most distinguished pupil, shows a tendency towards the rococo in such works as the National Monument in the Niederwald.

At Munich the tendency was towards romanticism, modified by the classic style. Konrad Eberhard (1768–1859) executed a large number of mediæval subjects. Ludwig Schwanthaler (1802–48), notwithstanding his training under Thorvaldsen, was best in the treatment of national subjects of a Romantic character. Not until the end of the nineteenth century did the Naturalistic tendency definitely triumph, especially at Berlin in the work of Reinhold Begas (1831–1911, whose art masterpiece is the memorial to William I, unveiled 1897), Eberlein, Geiger, Schott, and others. Much more pronounced is the powerful naturalism, in their sculptural efforts, of the painters Franz Stuck in Munich and Max Klinger (a master of polychrome sculpture) at Leipzig, where also Karl Seffner is conspicuous as a Realistic portrayer. In Vienna the modern period was ushered in by Fernkorn (1813–78), of Schwanthaler's school, and counts among its chief representatives Zumbusch, Kundmann, Weyr, and, pronouncedly Naturalistic, Viktor Tilgner (1844–96). Arthur Strasser (1854–) is especially noted for his polychrome statuary. Among the German sculptors who settled in foreign parts the most distinguished are Emil Wolff (1802–79) in Rome and Adolf Hildebrand (1847–) in Florence.

Other European Countries. In Italy the classical tendency has been stronger than elsewhere in Europe, and the ultimate triumph of realism has therefore been more retarded. The chief pupil of Canova was Pietro Tenerani (1789–1869), afterward an ardent follower of Thorvaldsen; Pompeo Marchesi (1789–1858) is known for his colossal statues. The Italian Romanticists tried to unite Naturalistic with classical tendencies, as may be seen in the works of Bartolini (died 1850), Pampaloni (died 1847), and Pio Fedi (1815–92). Far more Naturalistic, though still classical, compared with other contemporary European sculptors, were Giovanni Dupré (1817–82), Vicenzo Vela (1822–91), and Giulio Monteverde (1837–). The most important sculptor of the present day is Ettore Ximenes (1855–), who has executed a large number of monumental works of importance.

The Scandinavian countries followed the general European development, the Renaissance finding entrance later than elsewhere in Europe. The influences were at first Netherlandish, but during the eighteenth century French masters were mostly employed. In Sergel (1740–1814) Sweden possessed a Classicist whose works are said to bear favorable comparison with those of Thorvaldsen. Byström (1783–1848) and Fogelberg (1786–1854) followed in his wake. Sergel's pupils and those of Thorvaldsen in Denmark early tended towards Romantic subjects from Norse mythology. Most akin to the latter's art was that of the Dane H. V. Bissen (1798–1868). At present the general tendency in these countries is Naturalistic, after French models, and its most prominent exponent is the Norwegian Stefan Sinding (1846–). A strong naturalism, combined with sharp characterization, is also the principal trait of Russian sculpture, which is of very recent growth. Among the best-known artists are Lanceray, whose bronzes are full of spirited action combined with detailed execution, and Lieberich (1828–), a sculptor of animals; but the most eminent of all was Antokolski (1843–1902).

United States. Neither distinguished foreigners like the Italian Cerachi and the Frenchman Houdon, who came to America during the eighteenth century, nor self-taught Americans like William Rush (1756–1833), of Philadelphia, and John Frazee (1790–1852), had any influence on the development of American sculpture. The first artists of prominence belong to the schools of Canova and Thorvaldsen. The first to go to Rome was Horatio Greenough (1805–52), who carved portrait statues, like Washington as the Olympian Zeus, in classical garb, and a number of refined busts. Hiram Powers (1805–73), whose "Greek Slave" is well known, was a conscientious Classicist. Thomas Crawford (1813–57) was more original, mingling the classical spirit with American sentiment. Other representatives of the same group were William Wetmore Story (1819–95), Randolph Rogers (1825–92), the more gifted William Henry Rinehart (1825–74), and Harriet Hosmer (1830–1908). The native element, as distinguished from classicism, appeared in the works of several early sculptors. A very important representative, Erastus Dow Palmer (1817–1904), whose art was able, original, and refined, carved the best nudes and reliefs of the early period. Clark Mills (1815–83) created the first equestrian statue, that of General Jackson at Washington; but a new standard for public monuments was set by Thomas Ball's (1819–1911) equestrian Washington at Boston. Distinctly national in spirit were Henry Kirke Brown (1814–86), whose vigorous equestrian statue of Washing-

ton in Union Square, New York, was epoch-making, and his pupil J. Q. A. Ward (1830–1910), who is widely known for his statues and statuettes of Indians and negroes and excellent in composition and form. John Rogers's (1829–1904) popular statuettes of military and domestic subjects were a sample of a variety of art which prevailed just after the Civil War.

Since about the time of the Centennial Exposition (1876) classicism has ceased to influence American art. A number of sculptors like Ephraim Keyser (1850–), of Baltimore, had German training, while others remained in Italy, but by far the most important influence has come from Paris. Howard Roberts (1843–1900) was the first to show French influence; Olin Levi Warner (1844–96), a pupil of the Ecole des Beaux-Arts, had executed strong characteristic busts and portrait statues, as well as work in higher relief, when his life was terminated by an accident. Augustus Saint-Gaudens (1848–1907) gained remarkable fame from the decorative and illustrative character of his work. Daniel Chester French (1850–), whose training was chiefly American, is a master of sentiment treated in sculpture with infallible good taste and in remarkably pure forms. More thoroughly Parisian is Frederick MacMonnies (1863–), a pupil of Saint-Gaudens, who in a nervous, highly modern style has executed a number of statues with good taste and powerful realism.

Other important representatives of contemporary American sculpture are William Ordway Partridge; Herbert Adams, who, although modern and realistic, found inspiration in the Florentine Renaissance; Paul Bartlett, an original and clever technician; Karl Bitter (died 1915), who designed much architectural sculpture and impressive monuments; Charles H. Niehaus, a master of modeling; A. P. Proctor, sculptor of Indian life; Edward Kemeys, sculptor of American native animals. Among other sculptors George Grey Barnard attracted attention by his difficult and ambitious projects; Gutzon Borglum, a pupil of Rodin, by his powerful, well-modeled, and emotional figures; his brother Solon H. Borglum, by his Western subjects. Most important American sculptors have studios in New York, but there are other centres. In Boston the most prominent are Bela L. Pratt and C. E. Dallin, who has modeled Indian life; in Philadelphia, Charles Grafly, known for his symbolic subjects, and A. S. Calder; in Chicago, Lorado Taft, also a well-known writer and lecturer, and C. J. Mulligan, sculptor of labor subjects; and in San Francisco, Douglas Tilden, an original and powerful artist, and (for long) R. I. Aitken.

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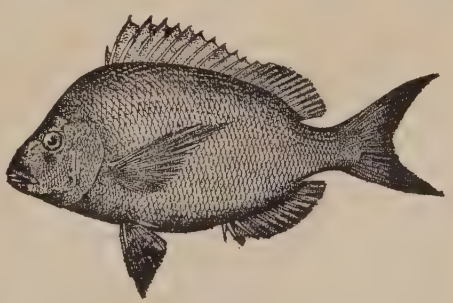
See BYZANTINE ART; CHRISTIAN ART; RELIEF SCULPTURE; ROMANESQUE ART.

SCULPTURE SOCIETY, NATIONAL. A society formed in New York in 1893 to foster the taste for, and encourage the production of, ideal sculpture for the household and museum; to promote the decoration of public buildings, squares, and parks with sculpture of a high class; to improve the quality of the sculptor's art as applied to industries; and to provide from time to time for exhibitions of sculpture and objects of industrial art into which sculpture enters. There are two classes of members —sculptors and nonsculptors. The number of members in 1915 was about 80 of the former class and about 250 of the second.

SCUP (contracted from North American Indian *mīshcup*, from *mīshe-kuppe*, large-scaled, thick-scaled), SCUPPAUG, or PORGY. A fish



THE SCUP.

(*Stenotomus chrysops*) of the family Sparidæ (q.v.) resembling the sheepshead (q.v.), very abundant off the eastern coast of the United States south of Cape Cod and highly valued as a toothsome food fish. It is brown with bright reflections, and about a foot in length.

It approaches the coast to spawn among the eel grass in early summer and feeds mainly upon mollusks, sandworms, and other animal matter. This habit makes it exceedingly useful as a scavenger, and it congregates near fertilizer factories and similar places where offal is thrown into the sea. It is especially liked in Southern markets, where it is called porgy (q.v.), as also is a Southern congener (*Stenotomus aculeatus*). Consult G. B. Goode, in *Fishery Industries*, sec. i (Washington, 1884).

SCUR'VY (variant of *scurfy*, from *scurf*, AS. *scurf, sceorf*, OHG. *scorf*, Ger. *Schurf*, scurf, from AS. *sceorfan*, OHG. *scurfan*, Ger. *schürfen*, to gnaw, scratch), or SCORBUTUS. A constitutional disease, characterized by profound alterations in the blood resulting in hemorrhages beneath the skin, mucous membranes, and in other parts of the body, and by a spongy condition of the gums, anæmia, and great weakness. It is induced chiefly by the deprivation of fresh vegetable food and is not contagious. From the earliest times until the beginning of the nineteenth century scurvy had been the scourge of sailors. The cause was the exclusive diet then prevalent aboard ship of salt meat and hard bread, with a deficient and impure supply of drinking water, upon which sailors were compelled to subsist on long voyages. Since the beginning of the nineteenth century sea scurvy has become comparatively rare. The shorter voyages of modern times, owing to the introduction of steam, and the compulsory carrying of fresh meat, vegetables, and lemon or lime juice, introduced by Sir Gilbert Blake in 1795 into the dietary of the British navy, have made the disease almost unknown at sea, although it is still found on land among garrisons and in prisons, in starving, isolated communities, and among improperly fed infants.

Scurvy generally comes on slowly, with loss of color, weakness and apathy, and pains in the back and limbs. In a week or more small hemorrhages (petechiæ) occur under the skin in various parts of the body. The spots are small, red or reddish brown, some of them resembling bruises. Later there may be seen large extravasations of blood into the eyelids, and tense brawny swellings will be found at the bend of the elbows or knees, in front of the tibia, and under the angle of the jaw, due to the effusion of blood or serum into or between the soft tissues and the bones. The gums become swollen, spongy, ulcerated, and bleed easily. The teeth may loosen or even fall out. When the disease has lasted for some time, the patient has a bloated look, is short of breath, subject to fainting spells, and unable to exert himself mentally or physically. Nosebleed and swelling of the feet often occur. An affection of the vision known as hemeralopia may be an early symptom. This consists of entire blindness in the dusk or darkness, without interference with the sight during the day. Death takes place after several weeks from exhaustion or hemorrhage unless suitable treatment is instituted.

Children from six months to two years old are sometimes attacked with scorbutus (infantile scurvy, or Barlow's disease), the essential lesion of which is a subperiosteal hemorrhage, which causes thickening and tenderness along the shafts of the bones. It is said to occur as a result of exclusive feeding with condensed milk, the various prepared infant's foods, or sterilized milk. The disease is often associated with rickets and is characterized by an earthy pallor, spongy and bleeding gums (after dentition), and the swelling of the limbs referred to above.

Treatment depends on the use of an abundance of fresh vegetable food, such as onions, mashed potatoes, cabbage, lettuce, and spinach, with fresh meat, and the administration of lime, lemon, or orange juice in doses of three or four ounces daily. In infants the orange juice and the restoration of a diet suitable to the age will be sufficient. When the mouth is sore and mastication is impossible, milk, beef tea, broth, and eggs may be given. For the prevention of scurvy in time of war or on shipboard or in places where fresh food is scarce, canned vegetables will take the place of fresh to a great extent. In addition to these an ounce of lemon juice daily or the addition of the malates, citrates, tartrates, and lactates of potassium to the food or drink will be found efficient preventives.

SCURVY GRASS (*Cochlearia*). A genus of small annual, biennial, or rarely perennial plants of the family Cruciferæ, with an acrid biting taste, due to the pungent volatile oil characteristic of horse-radish. Common scurvy grass (*Cochlearia officinalis*), which is sometimes a foot high, is a very variable, widely distributed plant in rocky and muddy places, on high mountains, in Arctic regions, and on seashores throughout the world. It was formerly valued by sailors as a preventive of or remedy for scurvy. The common horse-radish used as a condiment is *Cochlearia armoracia* (or *Radicula armoracia*, as it is now called). *Barbarea verna* is sometimes grown as a winter salad under the name "scurvy grass."

SCU'TAGE, or **ES'CUAGE** (Lat. *scutum*, shield). A pecuniary tax sometimes levied by the crown in feudal times as a substitute for the military service due from a knight's fee. It dates from the early years of the twelfth century and was one of the subjects especially treated in Magna Charta. Consult J. F. Baldwin, *The Scutage and Knight Service in England* (Chicago, 1897).

SCUTARI, skōō'tä-rē (Turk. *Ishkodra*). A town of Albania, situated at the south end of the Lake of Scutari, 12 miles from the Adriatic (Map: Balkan Peninsula, B 3). It is a fortified town dominated by a citadel. There is an export trade in skins, woolens, sumach, and grain. Scutari, the ancient Scodra, fell into the hands of the Romans in 168 B.C. At the close of the Middle Ages it was in the hands of the Venetians. In 1477 it withstood an eight months' siege by the Sultan Mohammed II, but two years later was ceded to the Porte. As the capital of the Ottoman Vilayet of Scutari it remained in the hands of the Turks until in April, 1913, in the course of the Balkan War (q.v.), its gallant defender, Essad Pasha, after withstanding a six months' siege, was compelled to surrender it to the Montenegrins. The threats of Austria-Hungary, backed by those of the other Great Powers, proved sufficiently potent, however, to cause the Montenegrins speedily to relinquish the captured city and to consent to its incorporation in the newly created Principality of Albania. Relieved of this treaty obligation by the outbreak of the War in Europe in 1914, the Montenegrins again occupied Scutari. They were later driven out by the Teutonic allies. (See WAR IN EUROPE.)

Pop. (1914), about 32,000. Consult M. E. Durham, *The Struggle for Scutari* (New York, 1914).

SCUTARI (Turk. *Usküdar*). A town of Asia Minor, on the east shore of the Bosporus, opposite Constantinople, of which it forms a municipal circle (Map: Turkey in Asia, A 2). It contains eight mosques, bazars, baths, colleges, and schools. There are manufactures of silks, cotton fabrics, and leather. Before the advent of the railway at the neighboring Haidar Pasha, Scutari was the rendezvous and starting point of caravans trading with Asia Minor and Syria. It has long been famed for its extensive cemeteries, adorned with magnificent cypresses, the chosen resting place of many of the Turks of Constantinople. The town became famous during the Crimean War (1854–56), when the enormous barracks built by Sultan Mahmud were occupied by the English troops and formed the scene of Florence Nightingale's labors. Scutari occupies the site of the ancient Chrysopolis. About 2 miles to the south lies the village of Kadiköi, the ancient Chalcedon. Pop. (est.), over 100,000.

SCUTUM SOBIESKII, skū'tŭm sō-bĭ-ĕs'kĭ-ī (Lat., Sobieski's shield). A small northern constellation, lying between Aquila, Ophiuchus, and Sagittarius. It was formed by Hevelius in 1690 and named by him in honor of the Polish King John Sobieski. It contains the Horseshoe or Omega nebula and several fine clusters.

SCYLAX, sĭ'lăks (Lat., from Gk. Σκύλαξ, *Skylax*). A Greek geographer of the sixth century B.C. Herodotus (iv, 44) says that he was sent by Darius Hystaspis, probably about 508 B.C., to explore the lower course of the Indus. After accomplishing this, Scylax sailed west through the Indian Ocean and the Red Sea, completing the voyage in 30 months. According to Aristotle, *Politics*, vii, 14, Scylax wrote an account of his explorations, but the work named *Periplus* (Circumnavigation), now extant and bearing the name of Scylax (edited by Fabricius, 1883), is almost certainly of the fourth century B.C. Consult: C. Müller, *Geographi Græci Minores*, vol. i (Paris, 1855); E. H. Bunbury, *A History of Ancient Geography*, vol. i (2d ed., London, 1883); H. F. Tozer, *A History of Ancient Geography* (Cambridge, 1897).

SCYLLA (sĭl'là) **AND CHARYBDIS,** kà-rĭb'dĭs (Lat., from Gk. Σκύλλα, *Skylla*, and Χάρυβδις, *Charybdis*). Two sea monsters described in the *Odyssey* (xii, 73 ff.), personifications of the dangers of navigation near rocks and eddies. Scylla is described as dwelling in a cave in a precipitous cliff, a monster with 12 feet and six long necks, each bearing a head with three rows of teeth. With these she devours any prey that comes within reach and snatches six men from the ship of Odysseus. Opposite her, a bowshot's distance, is a low rock, where under a wild fig tree Charybdis sucks in and belches forth the water three times daily, and nothing that comes near can escape. This dangerous passage was early localized by Greek travelers at the Strait of Messina. Later legends make Scylla a beautiful maiden, beloved by a god (Glaucus or Poseidon) and transformed by a jealous rival (Circe or Amphitrite). The Greeks of the Saronic Gulf told how Scylla, daughter of Nisus, King of Megara, won by her love or by a bribe, betrayed her father to Minos (q.v.) of Crete. Minos, however, disgusted by her unnatural treachery, dragged her at his rudder until she was transformed into the monster or the sea bird Ciris, which is always pursued by the sea eagle into which Nisus had been changed. Consult: Otto Waser, *Skylla und Charybdis in der Literatur und Kunst der Griechen und Römer* (Zurich, 1894); D. Jobst, *Skylla und Charybdis* (Würzburg, 1902); C. M. Gayley, *The Classic Myths in English Literature and in Art* (2d ed., Boston, 1911).

SCYLLIS, sĭl'lĭs (Lat., from Gk. Σκύλλις, *Skyllis*). An early Greek sculptor whose name is associated with that of Dipœnus. See DIPŒNUS AND SCYLLIS.

SCYPHOZOA, sī'fô-zō'à (Neo-Lat. nom. pl., from Gk. σκύφος, *skyphos*, cup + ζῷον, *zōon*, animal). A class of Cœlenterata (q.v.) characterized by the scyphistoma or polyp-like early stage. See MEDUSA.

SCYROS, sī'rŏs, or **SKYROS,** skē'rôs. An island in the Ægean Sea, the largest of the northern Sporades, 25 miles northeast of Cape Kumi, Eubœa (Map: Greece, F 5). Length, 19 miles; area, 77 square miles. Scyros is mountainous in the south, but the northern part has fertile plains which produce excellent wheat. The principal industries are vine growing and the raising of sheep and goats. The only town on the island is Scyros, built on a high peak on the eastern coast, the broad summit of which is occupied by the ruins of a castle and was the site of "the lofty Scyros" of Homer. The island is connected with the Homeric legends of Theseus and Achilles. Pop., about 3500.

SCYTHIA, sĭth'ĭ-à (Lat., from Gk. Σκυθία, *Skythia*). According to the ancient Greeks, a vast, undefined region, lying north and east of the Black and the Caspian seas and inhabited by a large number of barbarous nomadic tribes; though in a more restricted sense the Scythians are identified with the Scoloti, who inhabited the plains of southeastern Europe. These tribes have been thought to be of Mongolian origin, but the prevalent modern opinion is that they belonged to the Indo-European family. They are frequently mentioned by Herodotus (see especially book iv) and other Greek writers and are described as herdsmen without settled abodes, living like gypsies in tent-covered wagons, cruel in war and filthy in their habits. In the seventh century B.C. they invaded Media and were driven off by Cyaxares only after a 10 years' struggle. Darius invaded their country about 508 B.C., but retreated after heavy losses from attacks and from the hardships of the trackless country. The Scythians of Europe were finally overcome and exterminated or assimilated by the Sarmatians (q.v.), who afterward occupied their country. In the farther East, however, the Scythian tribes maintained themselves and invaded Parthia and India, where their leaders adopted Buddhism and established dynasties that lasted for centuries. To the Romans Scythia meant the little-known wastes of northern Asia, from the river Volga to India and China. Consult: Charles Neumann, *Die Hellenen im Skythenlande* (Berlin, 1855); Reichardt, *Landeskunde von Skythien* (Halle, 1889); Ernst Krause, *Tuisko-Land* (Glogau, 1891); Latyshtchev, *Scythica et Caucasica* (St. Petersburg, 1893); E. H. Minns, *Scythians and Greeks* (2d ed., Cambridge, 1913).

SCYTHOP'OLIS (Lat., from Gk. Σκυθόπολις, *Skythopolis*). The classical name of a town of

Palestine, the biblical Beth-shean or Beth-shan, the modern Beisan, about 15 miles south of the Sea of Galilee and 3 miles west of the Jordan (Map: Palestine, C 3). Although assigned to the tribe of Manasseh (Josh. xvii. 11, 16), the original Canaanites kept possession of it (Judg. i. 27), and it is not until the days of Solomon that we find it in the hands of the Hebrews (1 Kings iv. 12). When Saul and his sons fell in the battle of Gilboa, the Philistines fastened their bodies to the wall of Beth-shean, whence the men of Jabesh-Gilead afterward removed them (1 Sam. xxxi. 10–13; 2 Sam. xxi. 12). Beth-shean was called Scythopolis in the third century B.C., at which time it was tributary to the Ptolemies. It belonged to the Decapolis. It was the seat of a Christian bishopric in the fourth century. There are extensive ruins in the neighborhood of the modern town, and many objects have been unearthed there, but no systematic excavation has yet been undertaken.

SEA. See Ocean.

SEA, Command of the. In a strategic sense, a nation which has command of the sea possesses a fleet sufficiently powerful to overcome any opposition that may be offered to its naval operations. It also implies the power to prevent all but minor operations of the enemy. A nation is regarded as having "command of the sea," even though some particular area is under the complete control of the enemy, provided it possesses sufficient power to blockade, seize, or control that area whenever it sees fit to do so. No nation is ever likely to possess such a command of the sea as to preclude naval operations of every kind by its opponents. Certainly none in modern times has had such power, notwithstanding the fact that several have possessed an enormous superiority over the enemy. See International Law; Mahan, A. T.; Navies; War in Europe.

SEA, Laws of the. See High Seas; Maritime Law; Navigation Laws; Rules of the Road.

SEA ADDER. The 15-spined stickleback (q.v.).

SEA ANEMONE. The name applied to polyps or zoöphytes (Actinozoa) which do not secrete a coral stock and resemble flowers, especially those of the mesembryanthemum. They are also called actinians. They are practically stationary, though they can slowly move over the surface of the rock to which they are attached. They are in general as broad as high and more or less vaselike, the mouth being surrounded by one or more circles of tentacles. They may attain a diameter of several inches, though few are ever more than 3 inches across. A common actinian (*Metridium marginatum*) is to be found between tide marks on rocks under seaweed, in tidal pools, but grows most luxuriantly on the piles of wharves and bridges. In the tentacles are lodged the lasso cells, or nematocysts (q.v.), by which it obtains its prey. When a passing shrimp or small fish comes in contact with certain tentacles, the barbed thread is thrown out from the lasso cell; these paralyze the victim, and the other tentacles assist in dragging it into the distensible mouth, where it is partly digested, the process being completed in the second or lower division of the digestive canal. At the base of certain tentacles are the eye specks. The process of taking food is almost purely reflex.

Nearly all actinians multiply by budding as well as by eggs. The new individuals arise at the base of the body, sometimes as many as 20 young ones growing out from the base and finally becoming free. Adult sea anemones in rare cases subdivide longitudinally. (See Schizogony.) The young grow up without any metamorphosis. In most actinians the digestive sac forms a blind pouch, but in *Cerianthus*, which lives in deep water, buried in the mud or fine sand, where it secretes a leathery tube, the stomach or intestine opens out at the end of the body. The young of the European *Cerianthus*, as also of *Edwardsia*, unlike those of other actinians, lives at the surface, being free-swimming. Consult: E. C. and A. Agassiz, *Seaside Studies in Natural History* (Boston, 1871); A. F. Arnold, *The Sea-Beach at Ebb-Tide* (New York, 1900); A. G. Mayer, *Sea-Shore Life* (ib., 1905).

SEA BASS. A large family (Serranidæ) of marine perchlike fishes, abounding in all warm seas and in some fresh waters. They remain as a rule in comparatively deep water except when they approach the shore for spawning in the early summer, are carnivorous (feeding near the bottom), are powerful swimmers and leapers, are often very handsomely colored and marked, and are excellent food. Some have commercial importance (see Fisheries), while others are prominent among game fishes. About 60 genera and 400 species are recognized in the family as now delineated. A typical species and the one best known under this name in the United States is the black sea bass (*Centropristes striatus*), illustrated in the Colored Plate of Food Fishes, with the article Fish as Food. It is about 18 inches long and three pounds in weight and is dusky brown or black, more or less mottled, and with pale longitudinal streaks. It is numerous along the Atlantic coast from Cape Ann to Florida and is one of the most highly esteemed fishes for the table. Local names for it are blackfish, black Harry, hannahill, and tallywag. This species is of special interest to fish culturists as the one with which Mather in 1874 first succeeded in producing artificial fertilization and demonstrated the practicability of modern methods.

Other prominent marine Serranidæ in America are the jewfishes, niggerfishes, groupers, hinds, guasas, scamps, squirrel fishes, and yellowtails. The typical genus *Serranus* is represented in Europe and in Eastern waters by familiar and useful species frequently called sea perches, of which a very handsome Eastern one (*Serranus marginalis*) is well known on Japanese and Philippine coasts. Consult, for classification, Jordan and Eigenmann, *United States Fish Commission, Bulletin No. 8* (Washington, 1888), and G. A. Boulenger, *Catalogue of Teleostean Fishes in the British Museum*, vol. i (London, 1895); also Fred Mather, *Modern Fish Culture* (New York, 1900); G. A. Boulenger, "Teleostei," in *Cambridge Natural History*, vol. vii (ib., 1904); Jordan and Evermann, *American Food and Game Fishes* (ib., 1914). See Colored Plate of Fishes of the Philippines with the article Philippine Islands.

SEA BATHING. See Sea-Water Therapy.

SEA BREAM. A British name for several fishes of the family Sparidæ (q.v.), especially a common and useful species (*Pagellus centrodontes*) of the European coast. The name sea bream is sometimes given to the American

SEA ANEMONES

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1 HELIACTIS BELLIS (THOMPSON)
2 MESACMÆA STELLATA (ANDRES)
3 AIPTASIA COUCHII (GOSSE)
4 CYLISTA IMPATIENS (DANA)
5 BUNODES THALLIA (GOSSE)
6 METRIDIUM PRÆTEXTUM (COUTHOUY)
7 HELIACTIS TROGLODYTES (THOMPSON)
8 ANTHEA CEREUS (GOSSE)
9 AIPTASIA UNDATA (MARTENS)
10 AIPTASIA DIAPHANA (ANDRES)
11 BUNODES MONILIFERA (DANA)
12 CORYNACTIS VIRIDIS (ALLMAN)
13 METRIDIUM CONCINNATUM (DANA)
14 SAGARTIA CHRYSOSPLENIUM (GOSSE)
15 ACTINOLOBA DIANTHUS (BLAINVILLE)

ALL ABOUT ½ NATURAL SIZE

"sailor's choice" (q.v.) (*Lagodon rhomboides*). See BREAM.

SEA'BRIGHT. A borough in Monmouth Co., N. J., 27 miles south of New York City, on the Central Railroad of New Jersey (Map: New Jersey, E 3). It is chiefly important as a summer resort. It dates from 1860. Pop., 1900, 1198; 1910, 1220; 1915 (State census), 1327.

SEA BUCKTHORN. See SWALLOW THORN.

SEA'BURY, SAMUEL (1729–96). The first Bishop of the Episcopal church in America. He was born at Groton, Conn., graduated at Yale in 1748, and later studied medicine and theology at Edinburgh. He was ordained deacon and priest at the end of 1753 and returned to America five months later, engaging in pastoral work first at New Brunswick, N. J., then at Jamaica, L. I. (1757–67), and at Westchester, N. Y. (1767–75). He was obliged to resign his parish owing to his Loyalist or Tory sentiments, which he advocated in able pamphlets, suffering imprisonment and practical exile for his convictions. In March, 1783, he was elected Bishop by the 14 Episcopal clergymen then resident in Connecticut and went to London to seek consecration from the English prelates. But various difficulties, chiefly political, stood in the way of their action, and after waiting more than a year he made the same request of the bishops of the Episcopal church in Scotland. They, unhampered by any connection with the state, were willing to act, and Seabury was accordingly consecrated on Nov. 14, 1784, by the bishops of Aberdeen and Moray and Ross and the Coadjutor Bishop of Aberdeen. He returned to America the following summer and was more or less formally recognized as in charge not only of Connecticut but of all New England. The validity of his consecration was, however, denied by some in the Middle and Southern States, and the question was not finally set at rest until the General Convention of 1789 formally declared in favor of it by a unanimous vote. He died at New London, Conn. Consult: Beardsley, *Life and Correspondence of Samuel Seabury* (Boston, 1881); W. J. Seabury, *Memoir of Bishop Seabury* (New York, 1908); and the authorities referred to under EPISCOPAL CHURCH.

SEABURY, SAMUEL (1801–72). A Protestant Episcopal clergyman, grandson of Bishop Samuel Seabury. He was born at New London, Conn., was ordained priest in the Protestant Episcopal church (1828), was editor of the *Churchman* (1833–49), rector of the Church of the Annunciation in New York City (1838–68), and professor of biblical learning in the General Theological Seminary (1862–72). He published: *The Continuity of the Church of England in the Sixteenth Century* (1853); *Supremacy and Obligation of Conscience* (1860); *American Slavery Justified* (1861); *The Theory and Use of the Church Calendar* (1872); *Discourses on the Holy Spirit* (ed. by his son, with memoir, 1874).

SEA BUTTERFLY. A pteropod mollusk (*Clione papilionacea*), a beautiful and rather large flesh-pink form, common in the Arctic seas, where it forms the food of the baleen whale and is called by the whalers brit. It has been observed on the Labrador coast rising and sinking in the water among the cakes of floe ice and is said to have been detected as far south as New York. It is an inch long, the body fleshy, not protected by a shell, the "wings" being rather small.

SEA CAT. See CATFISH; CHIMÆRA.

SEA CLAM. A large bivalve of the northeastern Atlantic coast (*Mactra solidissima*); it inhabits rather deep water, but is often cast ashore in large quantities and is useful as bait.

SEACOAST ARTILLERY. See COAST ARTILLERY; ORDNANCE.

SEA COW. A huge, herbivorous, aquatic mammal of the order Sirenia (q.v.). The name applies specifically to the extinct rhytina or Arctic sea cow (*Rhytina stelleri*), which once frequented Bering Strait, but was exterminated about 1767 by seal hunters and sailors, who found its beef-like flesh excellent eating. When discovered by Bering's expedition in 1741, it lived only on Bering and Copper islands. G. W. Steller, the naturalist of the expedition, made sketches and wrote an account of the animal, which he describes as 24 to 30 feet long, with a girth of 19 or 20 feet and weighing about 8000 pounds. The head was small, and the jaws had, instead of teeth, horny pads similar to those in the mouth of the dugong. The skin was very thick, dark-colored, and rough. The rhytina was gregarious and dwelt in herds about the mouths of streams, where it lived on seaweeds. It was unable to dive, and hence was restricted to shallow water, where its feeding was often prevented by ice, so that in winter many starved. It was stupid, sluggish, and comparatively helpless. Consult: L. H. Stejneger, in *United States National Museum, Proceedings*, vol. vii (Washington, 1884); id., in the *American Naturalist*, vol. xxi (Salem, Mass., 1887); also N. A. E. Nordenskiöld, *Voyage of the Vega* (Eng. trans. by Alexander Leslie, 2 vols., New York, 1881).

SEA CUCUMBER. A holothurian (q.v.). The name, which refers to the shape, is appropriate only for certain of the pedate species, most of the footless forms being more or less elongated and wormlike. Cf. TREPANG.

SEA DEVIL. A large fish, especially the great ray (*Manta birostris*).

SEA EAGLE. See EAGLE.

SEA ELEPHANT. See ELEPHANT SEAL, and Colored Plate of SEALS.

SEA FAN. An alcyonarian (see ALCYONARIA) coral, in which the form of the colony is like a fan, being very greatly flattened, so that it becomes wide and high, but very thin. Moreover, it is not solid, but consists of an open network, with the meshes of comparatively small size. The forms to which the name is most popularly given are species of *Gorgonia*, and especially the common West Indian species, *Gorgonia flabellum*. Fine specimens are sometimes 4 feet high and nearly as far across. The color is very variable, but is usually yellow or dull reddish purple. Sea fans are sparingly represented in a fossil state; only a few forms are known from Cretaceous and Tertiary rocks. See GORGONIACEA.

SEAFORTH. See WATERLOO-WITH-SEAFORTH.

SEAGER, sē'gẽr, HENRY ROGERS (1870–). An American economist, born in Lansing, Mich. He was educated at the universities of Michigan (Ph.B., 1890) and Pennsylvania (Ph.D., 1894) and at Johns Hopkins, Halle, Berlin, and Vienna. He was assistant professor of political economy at the University of Pennsylvania from 1897 until 1902 and at Columbia was adjunct professor of economics from 1902

to 1905 and thereafter professor. He came to be regarded as a leading authority, especially as regards labor and trust problems. He was a member of several commissions in New York to investigate labor conditions, became president of the American Association for Labor Legislation, served on the board of editors of the *Political Science Quarterly*, contributed numerous articles to economic and other journals, and wrote: *Introduction to Economics* (1904); *Economics, Briefer Course* (1909); *Social Insurance* (1910); *Principles of Economics* (1913).

SEA GRAPES. See Egg, *Eggs of the Lower Invertebrates;* Seaside Grape.

SEAHAM (sē'am) **HARBOUR.** A seaport in the County of Durham, England, 5 miles south of Sunderland (Map: England, E 2). It has a finely equipped harbor, a seaman's infirmary, and the Londonderry Literary Institute. Bottle works, blast furnaces, an iron foundry, and chemical works are its principal industrial establishments. The chief article of export is coal. Seaham was founded in 1828 by the Marquis of Londonderry. Pop., 1901, 10,200; 1911, 15,757.

SEA HARE. See Gastropoda.

SEA HOLLY. See Eryngo.

SEA HORSE. One of the small strange syngnathous fishes of the pipefish family, which constitute the genus *Hippocampus* and its near allies and take their name from the rude resemblance of the head to that of a horse. The body is compressed, with an elongated tail, and the integument is a series of large, rectangular bony plates, with a series of spines and projections along the lines of juncture. These spines, together with the divided, streamer-like fins of some species, give them a strong resemblance to the seaweeds among which they live. There are about 20 species in various warm and temperate seas. All keep near the shore, often developing in brackish water; and as their powers of swimming are feeble, they have become able, by the development of prehensility in the tail, to cling firmly to weeds and other supports and so resist being swept away. Like the pipefishes (q.v.), the males take charge of the eggs, which are placed in an abdominal pouch and remain there until they hatch; and for some time afterward the fry will, when alarmed, return to the shelter of the pouch. *Hippocampus hudsonius*, the common species of the Atlantic coast of North America, reaches a length of about 3 inches. Consult Albert Gunther, *Introduction to the Study of Fishes* (London, 1880), and D. S. Jordan, *Fishes* (New York, 1907).

A SEA HORSE.

SEA ISLANDS. A group of low sandy or marshy islands on the coast of South Carolina between Charleston and Savannah. They are separated from the mainland by a series of lagoons, sounds, and narrow, tortuous channels. Their soil is especially well adapted for rice and cotton, the latter, for which the islands are celebrated, being a fine long-stapled variety.

SEA KALE, or Crambe (*Crambe maritima*). A perennial plant of the family Cruciferæ native to European seacoasts. Its blanched sprouts are eaten like asparagus. Sea kale is especially popular in England, but is grown to a limited extent elsewhere. Sea kale is generally propagated by offsets or cuttings of the roots and sometimes by seed. A plantation remains productive for several years. See Chard.

SEAL (OF. *seel, scel*, Fr. *sceau*, from Lat. *sigillum*, seal, mark, dim. of *signum*, sign, mark, token). By ancient common law a seal must consist of a piece of wax, lead, or other tenacious metal or substance, stamped with words or a device, according to the fancy of the person adopting it. At present two of the most common devices are: a circular bit of paper stamped in some manner and attached to the instrument by mucilage; the impress of a design or words in the paper of the instrument itself by means of a die.

Introduced at a time when practically only the clergy could write, and used for a long time instead of signatures on private writings, etc., as well as legal instruments, seals did not originally invest an instrument with any distinctive solemnity, but after the art of writing became a common accomplishment and most private writings, not of a legal nature, were signed instead of sealed, the courts began to attach a peculiar and arbitrary efficacy to a sealed legal instrument as distinguished from one bearing merely a signature. After feoffment as a means of transfer of land was abolished, all conveyances were required to be under seal. The most important effect ascribed to the use of a seal was that it conclusively imported consideration for a promise or obligation contained in a sealed instrument. One of the peculiarities of sealed instruments is that only the persons actually signing and sealing may sue or be sued thereon.

However, to-day in the United States the matters of the necessity for a seal on various instruments and the kind of a seal required when necessary are almost wholly regulated by statutes. In New York and Connecticut the word "seal" or the Latin abbreviation L.S., written on the instrument, is sufficient; and in Alabama, Delaware, Florida, Georgia, Idaho, Illinois, Maryland, Michigan, Missouri, New Mexico, North Carolina, Oregon, Pennsylvania, South Carolina, Virginia, and West Virginia a scroll executed with a pen will be sufficient. In New Jersey, Wisconsin, and Wyoming any device or flourish with the pen will be recognized as a seal if intended as such.

In the following States the distinction between sealed and unsealed instruments has been abolished: Arkansas, California, Minnesota, North Dakota, South Dakota, Mississippi, Indiana, Kentucky, Nebraska, Ohio, Tennessee, and Washington.

It is not necessary for individuals to use seals in Alabama, Arizona, Colorado, Idaho, Iowa, Kansas, Montana, Nevada, Oklahoma, Texas, and Utah. Most States, however, require a seal on instruments executed by corporations. Public officers are usually required to have official seals, and all important public documents must be impressed with the proper seal.

The courts will usually recognize without proof the seals of nations and of the various States of the United States, the seals of superior courts and of public officers within their own State, including notarial seals. See CONSIDERATION; CONTRACT; NOTARY PUBLIC.

Bibliography. Edward Edwards, *Great Seals of England* (London, 1837); W. de G. Birch, *Catalogue of Seals in the British Museum* (6 vols., ib., 1887–1900); Sir William Blackstone, *Commentaries* (4th ed., 2 vols., Chicago, 1899); Theophilus Parsons, *Law of Contracts* (9th ed., Boston, 1904); W. de G. Birch, *Seals*, in Connoisseur's Library (New York, 1907); J. H. Bloom, *English Seals*, in "Antiquary's Books" (London, 1910).

SEAL (AS. *seol, siol*, OHG. *selah, selach*, seal). A term applied to marine carnivorous mammals of the suborder Pinnipedia, commonly known as fur seals, sea lions, hair seals, sea elephants, and sea leopards—animals widely distributed throughout the polar regions and the temperate zones, one or two species being tropical. Structurally they divide into two groups, the Otariidæ, or eared seals, and the Phocidæ, or earless seals. Both classes of animals are probably of land origin, the Otariidæ less remotely so; they have become almost perfectly adapted to life in the water and resort to the land or the ice floes only for purposes of breeding and of rearing their young.

The Otariidæ have the external ear present; the neck is elongated; the fore limbs are strongly developed and modified into oarlike appendages, the organs of swimming and the chief support of the body on land. The hind limbs are poorly developed, furnish little support for the body, and in swimming are extended backward, acting as a rudder; they are, however, capable of bending forward at the knee, enabling the animal to stand erect like the dog or bear and to run or lope along the ground with considerable facility. The Otariidæ readily divide into two groups, the sea lions and the fur seals or sea bears.

The sea lions are the largest of the eared seals; they are devoid of fur and thus, as well as by their greater size, distinguished from their neighbors, the fur seals; they have no special commercial importance. Of the three genera the Steller sea lion, *Eumetopias stelleri*, is the largest and best known. It breeds at New Year's Point and the Farallon Islands on the Californian coast and northward throughout Alaska, notably on the Bogoslov Island, the Pribilofs, and the Commander Islands; it is found also on the Aleutian and Kurile Islands and extends as far down as the southern limit of Japan. The Steller sea lion is the more conspicuous of the two animals which have made the seal rocks of San Francisco famous. It is yellowish gray in color. The adult males reach a length of 9 to 12 feet with a girth of 8 to 10 feet and a weight of 1200 to 1800 pounds; the females are smaller, having a weight of 400 to 600 pounds. The animals are polygamous, the harems ranging from 20 to 30 females each; the single young, of a bright-chestnut color, is born in May. Shellfish form the chief food of the Steller sea lion, as the lime deposits upon its breeding grounds indicate. The natives of the Pribilof Islands use its flesh for food when they can get it, and before the advent of the company store they used the lining of the intestines for making raincoats (*kamlaikas*) and the throats for boot tops; sea-lion skins sewn together and stretched over wooden frames are still used for boats (*bidarrahs*), and all freight for the Pribilof Islands is lightered in to shore by such boats. Never very numerous, the sea-lion herds are now much reduced by indiscriminate killing, those of the Pribilof Islands numbering less than 500 animals in 1915.

The California sea lion, *Zalophus californianus*, is a smaller animal, the adult males from 7 to 8 feet in length, the females 5 to 6 feet; its color is dark chestnut brown. It shares interest with the Steller sea lion on the seal rocks at the Golden Gate and breeds on the Farallons and at points on the Oregon and Washington coasts, extending as far north as Resurrection Bay in Alaska, but is most numerous about the islands off the southern Californian and Mexican coast. It is a much more intelligent animal than the big sea lion and is captured and trained for menageries and aquaria. It sometimes ascends rivers and has been known to steal fish from nets, thus incurring the enmity of the fishermen, an enmity which at times has been unjustly extended to the Steller sea lion. A second species of *Zalophus* is found in Australian waters and those of the southern shores of Japan.

A southern sea lion, *Otaria jubata*, is found at the Galapagos Islands and on both the Atlantic and Pacific coasts of South America. It is a large animal, ranging about one-eighth smaller than the Steller sea lion, which it resembles.

The fur seals only of the Otariidæ have commercial importance. Structurally they correspond closely to the sea lions, but they differ in having the rich, silky undercoat of fur, the sealskin of commerce. Two genera exist, *Arctocephalus* of the Southern Hemisphere and *Callorhinus* of the North Pacific Ocean. Of the first genus the important species are: *A. townsendi*, Guadalupe Island; *A. philippii*, Galapagos Islands and coast of Chile; *A. forsteri*, New Zealand and southern Australia; *A. australis*, southern coasts of South America and neighboring islands; *A. delalandi*, islands off South Africa; *A. gazella*, Kerguelen and neighboring islands. These southern herds, once very populous, are now practically extinct through excessive slaughter; small remnants only remain, on Lobos Island in the river La Plata and on islands near Cape Horn, where they receive government protection.

The northern fur seal, *Callorhinus*, is confined to the North Pacific Ocean and Bering Sea. Three species are recognized: *C. ursinus*, Commander Islands, the original species discovered and described by Steller in 1741; *C. alascanus*, Pribilof Islands, found in 1786; *C. curilensis*, of Robbin Island and the Kurile Islands. The typical male fur seal, or bull, attains maturity at the age of seven years, weighs 400 to 500 pounds, is about 6 feet in length, and has a girth of about 4½ feet. His color is blackish or dark brown, with yellowish-white water hairs especially long on the back of the neck, forming the so-called "wig" or mane. The adult female, the cow, is smaller, averaging about 80 pounds in weight, with dimensions in proportion; her color is varying shades of brown. She bears her first young, the pup, at the age of three years and has a breeding life of about 10 years. The breeding grounds are bowlder-strewn beaches

or rocky slopes near the shore, where the animals congregate in close-set masses, called rookeries. The fur seals are intensely polygamous, each adult male getting about him as many females as he can control; these groups, called harems, range in size from one or two to 100 cows. In early May the adult males arrive, taking up their places on the shore and defending them against late comers; the cows begin to arrive in early June, gradually filling up the rookeries, which reach their maximum development about the middle of July. The single young is born soon after the landing of the mother; she is reimpregnated within a day or two and within a week goes to sea to feed, alternating for the rest of the summer between the feeding banks, 100 to 200 miles offshore, and the rookery where she continues to nourish her young. At the age of a month or six weeks the pups take to the water and soon become expert swimmers. The young males of two, three, and four years, called bachelors, herd by themselves on beaches removed from the breeding seals, from which they are driven up and handled in the process of land sealing, which means the removal of the superfluous males. Having fasted from their arrival in May, the bulls withdraw to sea in early August to feed and rest. With the approach of winter, in late November, all classes of animals leave the islands for the long swim to the south. Mothers and pups separate, the former making a quick journey downward to the latitude of southern California, the latter lingering in Bering Sea and the Aleutian bays and passes, getting no further south than the latitude of Cape Flattery, where they meet the older animals and return with them. The northern journey is made slowly along the 100-fathom curve where the seals find their preferred food, squid and a small smeltlike fish as yet unknown to science except as found in the stomachs of feeding seals. Class by class the animals arrive back at the islands in the spring and take up again the interesting round of rookery life. The animals of the Commander Islands and Robbin Island follow an identical round of life, except that in the case of the former the migration journey is south along the Pacific coast of Japan to its southern limit, the return being on the same track, while in the case of the latter the winter migration is in the Sea of Okhotsk and the inland Sea of Japan. The Pribilof herd numbered at the time of its maximum development about 2,500,000 animals, that of the Commander Islands about half as many, and the Robbin herd about one-tenth. For the season of 1914 the Pribilof herd was estimated at 295,000 animals. The Pribilof Islands lie in the southeastern portion of Bering Sea, their nearest port being Unalaska in the Aleutian chain; they belong to the United States. Russia owns the Commander Islands, which are situated off the coast of Kamchatka. Robbin Island belongs to Japan and lies off the Island of Sakhalin in the Sea of Okhotsk.

The true or earless seals, the Phocidæ, embrace the hair seals, sea elephants, and sea leopards. The external ear is lacking, the neck is short, and the head can be raised but slightly. The fore limbs are little developed and furnish no support for the body; they are of use chiefly in that their strong claws enable the animal to take hold of the edges of the ice and rocks in landing. The hind limbs have greater development and are the organs of swimming; they are extended backward and are used as the fish uses its tail. They are not capable of bending forward at the knee, and the animal has little facility of motion on land, movement being accomplished by a series of jerky hitches in which the spine is alternately bowed up and straightened out as in the case of the inchworm. Animals of this group are generally believed to be monogamous, except, perhaps, the sea elephants. The commoner species breed on the rocks about the shores of bays and harbors, the more numerous and commercially important species on the ice floes of the Arctic and Antarctic seas.

The sea elephants and sea leopards have no special commercial importance. Two of the sea elephants may be mentioned. *Mirounga angustirostris*, of the west coast of Mexico and southern California, once numerous about Guadalupe Island, were huge animals, the males reaching a length of 18 to 22 feet, the females about one-third as large. They were hunted for their hides and for the oil obtainable from their blubber; a record exists of 210 gallons of oil from a single animal. This sea elephant is now practically extinct. A second species, *M. leonina*, belongs to the Southern Hemisphere, formerly found at Juan Fernández and the Falklands and still existent on South Georgia; Robert C. Murphy has given an interesting account of the animal from the latter island in the *Bulletin of the American Museum of Natural History* for 1914. The term "sea leopard" is applied to two species of large spotted seals of the Antarctic, one of them the Weddell seal, pictured in the films of the Scott South Pole expedition.

The hair seals are the important animals in this group. The commonest form, the harbor seal, *Phoca vitulina*, is found in bays and sheltered waters throughout the globe; it is a small animal, 3 to 5 feet in length, yellowish white with brown spots or markings. Most numerous and important is the harp or saddleback seal, *P. grœnlandica*, named from its peculiar markings thought to resemble an ancient harp. It is a larger animal, reaching a length of 5 to 6 feet, extremely gregarious, and found in great herds at the breeding season on the ice fields off Newfoundland and northward. The ringed seal, or floe rat, *P. fœtida*, is also Arctic in distribution; it corresponds in size with the harp seal; with the bearded seal, *Erignathus barbatus*, it is esteemed by the Eskimo as a source of food and clothing, but has no commercial importance. The gray seal, *Halichœrus grypus*, 8 to 9 feet in length, and the hooded seal, *Cystophora cristata*, also a large animal, are found in small numbers in Greenland and Arctic waters. *P. caspica*, of the Caspian Sea, and *P. siberica*, of Lake Baikal, are small seals, corresponding to the harbor seals, but form a catch of considerable importance to the Russian government. *Monachus monachus*, the monk seal, is found in the Mediterranean.

The life history and habits of the hair seals are not so well known as those of the fur seals because the animals are less accessible for purposes of study. In general they are less definitely migratory than the fur seals, although many of the Arctic species pass to the south with the ice in winter and return to the north in the spring for the breeding season. No accurate enumeration of the hair-seal herds

SEALS

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1 FUR SEAL — CALLOTARIA ALASKANA
2 CALIFORNIA SEA-LION — ZALOPHUS CALIFORNIANUS
3 SEA ELEPHANT — MIROUNGA LEONINA
4 WALRUS — ODOBEMUS ROSMARUS

is possible. Estimates of the catch at its maximum period for the various sealing areas give a total annual catch of approximately 1,000,000 animals, from which fact some idea of the vast number of the seals may be inferred. Consult: J. E. Gray (comp.), *Catalogue of Seals and Whales in the British Museum* (2d ed., London, 1866); J. A. Allen, *History of North American Pinnipeds* (Washington, 1880); and references given under SEALING. See HARBOR SEAL; HARP SEAL.

SEA LEOPARD. A seal (*Ogmorhinus leptonyx*) of the monk-seal group, widely distributed in the southern oceans. It grows to be 10 feet long and is the largest of the southern hair seals, excepting the elephant seal (q.v.). It takes its name from its spotted gray-and-white coat.

SEA LEVEL. See GEODESY.

SEALING. Seal fisheries are of two types, corresponding to the two groups of animals. The older form is the hair-seal fishery, in which the animals are sought for the hide and oil; in the fur-seal fishery the fur, or sealskin, is the object sought.

The hair-seal fishery has its chief field of operation on the ice floes off Labrador and Greenland. St. John's, Newfoundland, is the principal port of departure for the vessels engaging in it; a few vessels come from English ports. Sailing vessels leave St. Johns about March 1, steam vessels 10 days later, and begin sealing as soon as the animals are found; the season lasts through April. The animals are taken shortly after the close of the breeding season and while they are still on the ice caring for their young. The young seals are the important element, making up three-fourths to four-fifths of the catch. Landing on the ice, the sealers round up the animals, dispatching them with clubs and by shooting. The skins with the adhering blubber are removed and transferred to the vessel at the close of the day. This process is repeated day by day until a cargo is obtained. At port, sometimes on the voyage, the blubber is separated from the hide and then placed in vats for the later rendering into oil.

Seal oil is used as a lubricant, for illumination, and in manufactures; leather from the hide is made into shoes, handbags, trunk coverings, knapsacks, and like things. In addition to this sealing by vessels a limited catch is taken from the shore about Newfoundland and the Gulf of St. Lawrence by means of nets, traps, deadfalls, and guns. Similar methods are employed by the natives of Greenland and elsewhere in the Far North. The beginning of hair-seal hunting dates back into the eighteenth century. For 1805 we have a record of 81,000 seals taken. In 1807 the sealing fleet numbered 30 vessels. A catch of 126,000 seals was taken in 1815; one of 306,000 in 1822. Newfoundland sealing reached its record era in the period 1830–50, with a fleet of 400 vessels, employing about 10,000 men and taking catches ranging from 500,000 to 700,000 seals annually. The catch subsequently declined through oversealing. For the period 1881–1901 it averaged 226,000 annually. Measured by the record of exports in seal hides and oil from Newfoundland for the years 1901–05, which averaged $73,000 a year, there was a further falling off in the industry; but apparently it has recovered somewhat, as average annual exports in seal products for 1906–13 have been $325,000. Of specific catches in recent years complete records are not available, but the *Statesman's Yearbook* gives the catch of 1907 as 245,051 seals and that of 1913 as 272,065. The industry is therefore holding its own at about 250,000 animals annually.

Next in importance is the sealing about Jan Mayen Island to the north of Greenland. It is confined to a limited area of about 400 miles in diameter and has therefore been at times very destructive. By international agreement this sealing is not allowed to begin before April 3 and it closes early in June. The vessels engaged in it come chiefly from continental ports, Hamburg, Tromsö, Tönburg, Dunkirk, and a few from English ports. In 1760 a fleet of 19 vessels is recorded as engaged in this sealing, with a catch of 44,000 seals. In 1868 a fleet of Norwegian vessels, 15 in number and employing 600 men, took 65,000 seals. For the period about 1880 the catch numbered 200,000 animals. This sealing has declined in recent years, and since 1895 English vessels have not taken part in it.

On the west coast of Greenland the natives hunt the seals for food and clothing, a moderate amount being taken each year for household and other uses. At Nova Zembla and in the White and Caspian seas extensive sealing operations are carried on by the Russians.

Originally small sailing vessels were employed in hair-sealing; in latter years these have given place to larger ships, propelled by steam. The vessels must be stanch, able to break through the ice and to withstand its pressure. It is a precarious business; vessels are often lost, some of them fail to find seals and return empty; but the catches in the main are good, sometimes as high as 30,000 to 40,000 seals a vessel, which at $1.50 to $3 each make a rich booty. The hair-seal industry has occupied less public attention than the fur-seal industry, but it has been and is in reality the more important of the two. Its product at the time of the largest number of these animals taken averaged very nearly 1,000,000 seals annually, at a value of from $1,500,000 to $3,000,000 approximately.

The fur-seal industry has had its principal development on the Pribilof Islands in Bering Sea; these islands were discovered in 1786. The Commander Islands, containing a herd half as large, had previously been discovered by the Bering expedition of 1741. Indiscriminate killing early threatened the extinction of the seal herds, but in 1799 the Imperial government placed its fur interests in Bering Sea in the control of a single corporation, the Russian-American Company. After some experimentation the principle of saving out the females and confining the killing to the superfluous young males was established, and under this arrangement the herd prospered. It passed into the control of the United States in 1867 with the territory of Alaska. Following the custom of Russia, the United States leased its industry for a period of 20 years, beginning in 1870, to the Alaska Commercial Company, and this company for 20 years took an annual catch of 100,000 sealskins, paying to the government in rentals and royalties approximately $350,000 annually. An indirect income from import duties on dressed sealskins brought back from London for consumption in the United States

was also received by the government. The total income for the 20 years approximated $13,000,000, nearly twice the total cost of Alaska. The North American Commercial Company succeeded to the lease in 1890 for a second period of 20 years, but the herd had declined; the catch did not average above 15,000 skins during the second lease, but seals had enhanced in value, and the direct revenue to the government amounted to $150,000 a year with indirect revenue in proportion. In 1910 the government took over directly the management of its fur-seal industry, its agents carrying on the operations of sealing and the product being sold in London through brokers. For the catch of 1910, numbering 13,000 skins, $437,000 was received; the 12,000 skins for 1911 brought $423,000. Since 1911 the commercial catch has been suspended by law of Congress and all revenue cut off.

Land-sealing, or the normal form of fur-sealing, consists in the removal of the superfluous young males at the ages of two and three years. It is analogous to the methods of handling the commoner domestic animals—cattle, sheep, poultry. The animals are driven up from their separate hauling grounds, sorted over, a breeding reserve set aside, those of killable size taken, and the rest returned to the sea. The skins are cured in salt and shipped to London for sale and to be dressed and dyed. Dressing a sealskin means the removal of the coarse water hairs which grow out beyond the fur. It is accomplished by shaving down the flesh side of the skin to cut off the roots of the hairs which grow deeper than the fur. The hairs are then pulled out, and the fur, originally a rusty brown, is dyed black, the process requiring seven dippings. Both these processes are trade secrets, and they require great care and skill; experienced and successful work at once doubles the value of the skin.

The decline of the fur-seal herd, amounting to nine-tenths of its breeding stock in 30 years, was due to the rise of a rival industry at sea, known as pelagic sealing, which took advantage of the migration and distant feeding habits of the fur seals. Vessels with Indian and white hunters, armed with spears and shotguns, were used. Going out from the Straits of Fuca, these hunters gradually covered the entire migration route of the seals and then began to attack the mother seals on their summer feeding grounds. Of the pelagic catch 65 to 85 per cent were nursing and gravid females, and with the mother seals died the unborn and dependent young. From about 5000 skins in 1879 the pelagic catch rose steadily to its maximum of 140,000 skins in 1894, taken by a fleet of 120 vessels. From this date it declined rapidly with the diminishing herd. In 1886 the United States, relying upon a right claimed by Russia in 1821 but never tested, began to seize sealing vessels operating in Bering Sea, among them Canadian vessels. This brought on a dispute with Great Britain, which was settled by an arbitration tribunal meeting in Paris in 1893. The question of jurisdiction in Bering Sea was decided adversely to the United States. Regulations were then formulated for joint control of pelagic sealing in the interests of the herd. These provided for a closed season of three months (May, June, and July) and a closed zone of 60-mile radius about the breeding islands. The regulations failed of their object because of the long period of gestation (12 months) and the fact that the mother seal feeds far beyond the protected zone. Pelagic sealing in August and September remained as destructive as ever, and the herd continued to decline. At the beginning pelagic sealing was shared in by Americans and Canadians; in 1898 Americans were forbidden by law to engage in it. In 1903 the Japanese took it up, and as they were not bound by the regulations of the Paris tribunal, their operations carried on from the 3-mile territorial line became unusually destructive. Finally, in 1911, the United States secured the coöperation of Great Britain, Russia, and Japan in a treaty suspending pelagic sealing for a period of 15 years; in return for the abandonment of pelagic sealing by citizens of Canada and Japan the United States and Russia agreed to share their commercial catches taken on land, 15 per cent each to each. In enacting the law necessary to give this treaty effect Congress in 1912 provided for the suspension also of land-sealing, completely for five years and to a limited extent for nine further years—practically the whole life of the treaty. Investigations of the herd in 1912, 1913, and 1914 have demonstrated that an adequate supply of male life exists and that the breeding stock of the herd is increasing in a normal way under the suspension of pelagic sealing, proving that the suspension of land-sealing was unnecessary. It is expected that this information will lead to the early repeal of the law.

The history of the fur-seal industry of the Commander Islands, under Russian control, has followed in a general way the course of that on the Pribilof Islands. Its product has been about half as great. In addition there has been a small fur-seal catch from Lobos Island in the La Plata River and another from the islands about Cape Horn, perhaps 20,000 skins a year in all. While these catches at the present time approximate the Bering Sea catches in size and importance, they are not susceptible of further development. Under the Treaty of 1911 the herds of Bering Sea will grow steadily to yield within the next 20 years an annual product of from 150,000 to 200,000 skins. Sealskins are worth at present in the raw state about $50 apiece. With the larger supply this price may be reduced somewhat, but the sealskin is a staple article and will always command a high price. The income to the United States from the herd of these animals near the Pribilof Islands, when fully restored, should exceed $5,000,000 annually. The fur-seal herds of Bering Sea have, since their discovery in 1741, yielded approximately 8,000,000 sealskins. See ALASKA, *Furs;* FUR AND THE FUR TRADE.

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(New York, 1914); Osgood, Preble, and Parker, *Fur Seals and Other Life of Pribilof Islands, Alaska* (Washington, 1915).

SEALING WAX. A composition of hard resinous materials used for receiving and retaining the impressions of seals. Common beeswax was first used as a sealing wax, being mixed with earthy materials to give it consistency. The Venetians brought the Indian sealing wax to Europe. The Indian wax was made only of shellac, colored with vermilion or some other pigment, and this has been found superior to all other materials. See LAC.

SEA LION. See SEAL.

SEAL ISLANDS. A group of islands off the coast of Peru. See LOBOS ISLANDS.

SEAL'KOTE. A city of the Punjab, India. See SIALKOT.

SEAL OF CONFESSION. See CONFESSION.

SEAL OF SOLOMON, ORDER OF THE. An Abyssinian order with two classes, founded by King John in 1874. The decoration is a six-pointed star, formed by two engaged triangles, bearing a jeweled cross and surmounted by the crown of Ethiopia.

SEAL OF THE UNITED STATES. The seal of the United States was decided upon June 20, 1782. The obverse consists of a bald eagle displayed, i.e., with wings and talons extended. On its breast is an escutcheon having a blue chief (there are no stars on the chief) and having below 13 pales, or upright stripes of equal width, alternately silver and red. The arrangement of the stripes differs from that of the national ensign, which is red and white. The sinister talon holds 13 arrows, and the dexter has a branch of olive, with 13 leaves and 13 berries. The eagle, arrows, and olive branch are in their natural hues. In the eagle's beak is a golden scroll, bearing the Latin motto "E Pluribus Unum" (One out of many). The tail feathers of the eagle in the seal are nine, although the bird itself always has 12. The crest over the eagle's head consists of a golden glory, issuing from a cloud and containing on a blue field 13 five-pointed silver stars arranged 1, 4, 3, 4, 1. The reverse, which has never been cut as a part of the seal, shows an unfinished pyramid, above which is an eye in a blue triangle, all proper. The lowest course of the pyramid bears the Roman numerals MDCCLXXVI. Beneath the pyramid, on a golden scroll, is the motto "Novus Ordo Seclorum" (A new era in the ages), and above is the motto "Annuit Cœptis" (He prospers our beginning).

SEA LOUSE. See FISH LOUSE.

SEALS'FIELD, CHARLES. The name assumed by KARL POSTL (1793–1864), an Austrian novelist and traveler in the United States, Mexico, and Central America, in early life secretary of a religious order in Prague and ordained priest. He fled in 1822 to the United States, where he traveled extensively, mainly in the Southwest. For a short time (1829–30) he was on the staff of the *Courrier des Etats-Unis*. He afterward resided mainly in Switzerland. In 1828 he published *Tokeah, or The Wild Rose*, and later some remarkable descriptive novels: *Der Legitime und die Republikaner* (1833, a rewriting of *Tokeah*); *Der Virey und die Aristokraten* (1834; rewritten as *Morton*, 1846); *Das Kajütenbuch* (1840); and the social studies *Lebensbilder aus beiden Hemisphären* (1835–37), *Deutsch-amerikanische Wahlverwandtschaften* (1835–37), and *Süden und Norden* (1842–43). Consult A. B. Faust, *Charles Sealsfield, der Dichter beider Hemisphären* (Weimar, 1896).

SEALSKIN. See SEAL; SEALING.

SEAMAN. In law, any man serving on board a seagoing ship below the rank of officer. In marine parlance a seaman is a mariner possessed of adequate knowledge of seamanship (q.v.). Whether an officer or a man "before the mast," he must know and be experienced in all things necessary for the efficient discharge of his duties. In a narrower sense a seaman is an experienced and competent mariner below the grade of officer; an "ordinary seaman" is one less experienced and competent. The (United States) Seaman's Act of 1915 provides that "licensed able seamen" for ocean work must be 19 years old and have had three years' service on deck at sea or on the Great Lakes. For Great Lakes work and that on bays, sounds, etc., the requirement is 18 months' service. Graduates of school ships are able seamen after a year's service at sea. An inferior grade of seamen may be so rated after 12 months' experience. All are required to pass an examination as to eyesight, hearing, and physical condition and to give evidence as to service and capabilities.

SEAMAN, sē'man, LOUIS LIVINGSTON (1851–). An American surgeon, born at Newburgh, N. Y. He graduated from Jefferson Medical College of Philadelphia in 1876 and the following year from University Medical College, New York, in which city he became connected with several hospitals and other institutions. In 1886 he made a tour around the world. During the Spanish-American War he served as surgeon of the First Regiment, United States Volunteer Engineers. For a part of 1905 Seaman remained with the second Japanese army in Manchuria during the Russo-Japanese War, and in 1914 he went abroad at the outbreak of the European War and offered his services to the hospitals of the Belgian army. His writings include: *The Real Triumph of Japan* (1905); *The Tse-Tse Fly and Sleeping Sickness* (1908); *Fair Play for the Republic of China* (1912).

SEAMAN, SIR OWEN (1861–). An English humorist, whose verse ranks with the best of its kind. He was educated at Shrewsbury school and at Cambridge. After holding a mastership at Rossall school and a professorship of literature at the Durham College of Science, Newcastle-on-Tyne, he was called to the bar at the Inner Temple in 1897. In this year also joining the staff of *Punch*, he became later its assistant editor, and in 1906 its editor. He was knighted in 1914. Some of Seaman's most diverting verse is in the field of parody. He published: *Oedipus the Wreck* (1888); *With Double Pipe* (1888); *Horace at Cambridge* (1894); *The Battle of the Bays* (1896); *In Cap and Bells* (1899); *Borrowed Plumes* (1902); *A Harvest of Chaff* (1904); *Salvage* (1908); *War Time Verses* (1915).

SEAMANSHIP. The science and art of rigging, equipping, manœuvring, and handling a ship or boat under all conditions. The advent of steam as the motive power has changed the character of seamanship to a large extent, but it has not lessened its importance. A moderate but accurate knowledge of steam engineering is necessary for officers as well as thorough information in regard to modern marine meteorol-

ogy and navigation. Consult: Todd and Whall, *Practical Seamanship for Use in the Merchant Service* (London, 1898); S. B. Luce, *Text Book of Seamanship* (rev. ed., New York, 1898); A. M. Knight, *Modern Seamanship* (5th ed., ib., 1910). See NAVIGATION; SAILINGS; STEAM NAVIGATION; ETC.

SEA MANTIS. See MANTIS SHRIMP.

SEAMEN, LAWS RELATING TO. In its broadest sense a seaman is a person engaged in navigation, but with respect to the laws affecting seamen the term is generally used in the sense which it is given in the construction of the British statutes regulating merchant shipping, as "any person (except masters, pilots, and apprentices, duly indentured and registered) employed or engaged in any capacity on board any ship."

Laws for the protection of seamen and sailors have been passed in all maritime countries, and the subject is very fully covered in the statutes of modern civilized nations. Details of the regulations of the English and American statutes differ from each other and from those of the non-English nations, but the general scope and purpose of such laws are the same in all European and American nations. In Great Britain most of the acts governing the subject of merchant seamen were consolidated into the Merchant Shipping Act of 1854 (17 and 18 Vict., c. 104), and most of the previous acts, beginning with that of Elizabeth (c. 13), were repealed in the same year. This act, with numerous amendatory statutes, governed the subject until 1894, in which year the acts affecting the subject were again consolidated in the Merchant Shipping Act of 1894. This last act did not materially modify the laws existing under the previous act, but was chiefly important for bringing the laws together in convenient form, and for its greater stringency affecting the provisions insuring the crew against overloading, undermanning, the carrying of dangerous cargoes, the inadequacy of life-saving appliances, and, in general, any deficiency or defect which might make the ship unseaworthy. There are various acts in the British colonies upon the same subject, some of which follow the Imperial statute, but most of them differ in various details. In Great Britain the Merchant Shipping Act of 1894 vests the general control of shipping interests in the hands of the Board of Trade and provides for the appointment of officers, called superintendents and deputy superintendents, whose general business is to afford facilities for engaging seamen by keeping registries of their names and character, to superintend and facilitate their engaging and discharging, to provide means of securing the presence on board at the proper times of men who are so engaged, and in general to carry out the regulations of the statutes concerning the dealings of the seamen with their employers. The Board of Trade has power to detain any vessel regarded as unseaworthy, subject to an appeal to a court of survey, and is authorized to prescribe a load water line (usually called Plimsoll's mark), and to provide for the proper indication by marks upon the side of the ship of the levels of the various decks, etc.

In the United States the subject is governed by the provisions of Revised Statutes, §§ 4554–4611, and the various amendments and additions made subsequent to them.

The terms "master," "seaman," and "owner," in the United States statutes, are defined, for the purpose of the acts, as follows: "Every person having command of any vessel belonging to any citizen of the United States shall be deemed to be the master thereof; and every person (apprentices excepted) who shall be employed or engaged to serve in any capacity on board the same shall be deemed and taken to be a 'seaman,' and the term 'vessel' shall be understood to comprehend every description of vessel navigating any sea or channel or lake or river to which the provision of this title may be applicable; and the term 'owner' shall be taken and understood to comprehend all the several persons, if more than one, to whom the vessel shall belong."

When in foreign countries the seamen may generally look to the consul of the country under whose flag they sail to enforce their rights against the master or owner of the vessel on which they are employed; and the rights of the master and owners are likewise enforced.

No detailed statement of the rights and duties of seamen can be given here. The laws of the United States, which may be taken as showing the spirit of the British laws, in general provide that the seaman must be under written contract duly executed; must present himself on board under severe penalties, and for unauthorized absence from the vessel forfeits three days' wages for an absence of less than 48 hours, and all back wages and property on the vessel when longer than 48 hours. He may be imprisoned for desertion, but he may not be flogged, as formerly, nor can forfeiture of wages be added to any form of corporal punishment. A seaman is entitled to medical attendance and aid without deduction from his wages, and if he dies on a voyage his heirs receive his full wages for the entire voyage.

By an Act of Congress passed in 1915, and popularly known as the La Follette Seamen's Act, the Revised Statutes were amended by the insertion of a provision that no vessel of 100 tons gross and upward, with certain exceptions, "shall be permitted to depart from any port of the United States unless she has on board a crew not less than seventy-five per centum of which, in each department thereof, are able to understand any order given by the officers of such vessel." (U. S. Stat. at Large, vol. xlv, p. 1169, 1915, c. 153.)

The rights of seamen are within the jurisdiction of the admiralty courts when they are engaged in trade or commerce on tide water or on the high seas; but for the purpose of this jurisdiction persons who do not contribute to the aid of the navigation of the vessel, or to its preservation in the course of their occupation, are not to be considered seamen; and, on the contrary, any person whose regular occupation would not impose these duties upon him may get the rights of a seaman by temporarily assuming the duties of one. See ADMIRALTY LAW; MARITIME LAW; and consult the authorities there referred to and the statutes of the various nations.

SEA MEW. See GULL.

SEA MOSS. See CARRAGEEN.

SEA MOUSE. A sea worm (see ANNULATA) of the genus *Aphrodite*. It is broad, short, somewhat flattened, and so densely covered with long fine setæ, or bristles, as to resemble a mouse. It grows to the length of about 2

inches and is not uncommon in the North Atlantic at a depth of from 5 to 20 fathoms.

SEA OF CORTES. See California, Gulf of.

SEA OF MARMORA. See Marmora, Sea of.

SEA OF OKHOTSK. See Okhotsk.

SEA OTTER. A marine otter (*Enhydris*, or *Latax, marina*) of the North Pacific shores and islands. It yields the most valuable of furs. It is about 3 feet long from nose to root of tail, and the tail is about 10 inches long. Its form is robust, the head massive, the color dark liver brown, paler on the head, and the tail is terete and obtuse. The hind feet are very broad, forming swimming organs like a seal's flippers, but with furry soles; the forepaws are small and catlike, and their palms are naked. The dentition resembles that of the otters (*Lutra*), but a pair of incisors in each jaw is lacking, and the molars have lost the sharp points seen in other Mustelidæ, in accordance with its peculiar diet. When Alaska was first visited by Russian traders they found this animal numerous on all the coasts of Alaska and of the Aleutian chain and other islands of Bering Sea, and as far south as Puget Sound, and secured thousands of their valuable pelts; but the onslaught made upon the race by Russian and Hudson Bay fur traders and the Indians reduced it so rapidly that the otter soon became rare except upon the most remote and difficult islands. One reason for the modern scarcity of the fur is the fact that the animal has changed its habits somewhat under the influence of man's persecution, and now spends much more of its time in the sea and seeks its food more constantly in deep water than formerly. Its food consists mainly of crabs and sea urchins with some fish. It has been most extensively studied and described by H. W. Elliott, whose many observations and statistics are summarized by Elliott Coues in his monograph *Fur-Bearing Animals* (Washington, 1877), where references to many other authorities will be found. Consult also W. P. Taylor, "Osteology and Evolution of the Sea-Otter," in *University of California, Publications*, vol. vii, no. 25 (Berkeley, 1914). See Plate of Fur-Bearing Animals.

SEA PEN. An alcyonarian (see Alcyonaria) coral of the family Pennatulidæ, in which the colony is bare of polyps at its base, while the lateral branches nearer the tip have large numbers. These branches are arranged in series on opposite sides of the central shaft so that the entire colony looks something like a rather stiff feather or quill pen. Sea pens occur in water of moderate depth, on sandy or muddy bottoms, where they are only lightly attached by the bare end of the shaft. They ordinarily reach a length of several inches, but an Arctic species of deep water (*Umbellularia grœnlandica*) may be 4 feet long. Some of them are richly colored, and some are highly phosphorescent.

SEA PERCH. See Bass; Sea Bass.

SEA PIE. See Oyster Catcher.

SEA PLANE. See Military Aëronautics and Plate.

SEA PURSE. See Egg, *Eggs of Fishes*.

SEA RAVEN, or Deep-Water Sculpin. A large, reddish-brown, much variegated sculpin (*Hemitripterus americanus*) of the coast of New England and Canada, which has a great number of spiny cirri and dangling fleshy appendages, a spinous dorsal fin of great length, and generally extraordinary aspect. See illustration under Sculpin.

SEARCH (from OF. *cercher, cerchier*, Fr. *chercher*, to search, from Lat. *circare*, to go around, traverse, from *circus*, ring, circus, Gk. κίρκος, *kirkos*, κρίκος, *krikos*, circle), Right of. As a part of the law of nations, the right of a belligerent to stop neutral merchant vessels on the high seas for the purpose of ascertaining their nationality and destination and the character and ownership of their cargoes, with a view to determining their liability to capture. This right follows as a necessary incident of the belligerent right of capturing an enemy's property at sea, of seizing contraband of war, and of blockading an enemy's coast, since liability to capture cannot be determined until a search has been made. But the right of search in such cases is restricted to merchant vessels only. This somewhat extraordinary usage is strictly a belligerent right, comes into existence at the outbreak of war, and ends with the conclusion of hostilities. All neutral vessels of whatever character are liable to search by a properly documented armed vessel of either belligerent and are subject to seizure and condemnation upon refusal to submit, although they may have been engaged in innocent traffic. But the belligerent whose vessel makes the search may be held responsible to the neutral concerned if the search is not conducted in a manner warranted by the law of nations. Unless regulated by treaty the manner in which the search is to be conducted is determined by the usage of nations. This matter is now frequently the subject of treaty regulation, and where so regulated the distance at which the searching vessel shall remain from the vessel to be visited, the number of persons permitted to take part in the search, and the amount of evidence necessary to satisfy the belligerent of the innocent character of the vessel are all specified. The notification of intent to visit a neutral vessel is usually given by firing an unshotted gun, which should be answered by the hoisting of the neutral flag and a heaving to, otherwise the belligerent cruiser is justified in resorting to force to compel obedience.

Neither the Convention of 1907 at London nor the International Naval Conference held there in 1908–09 adopted any provisions applicable especially to submarines. If the search discloses facts justifying seizure of the vessel as a prize, the warship need only exercise reasonable care in taking the prize into port; and if the protection of the warship demands it, the vessel may be destroyed. Before such destruction all persons on board must be placed in safety and the ship's papers preserved. (Declaration of London, 1908–09, Art. 50.)

To prevent the annoyances incident to the right of search, governments have sometimes arranged with one another that the presence of a public armed vessel with a fleet of neutral merchant vessels shall be regarded as sufficient evidence that they are engaged in a lawful trade. Many neutrals, among them the United States, have even claimed this as a right of international law without the necessity of sanction by treaty, but others, like England, deny the right. In addition to the belligerent right of search a similar usage with respect to foreign vessels is permissible in the following cases: to search vessels within the territorial waters of a state as a means of executing revenue laws; to search

vessels on the high seas on suspicion of piracy; to search merchant vessels on the high seas for the purpose of ascertaining their nationality. In general European nations have conceded the reciprocal right of detention and visitation of their vessels suspected of being engaged in the slave trade.

Prior to the War of 1812 the British government took advantage of the right of search to exercise what it regarded as its right of impressment (q.v.). For many years in connection with the suppression of the slave trade Great Britain endeavored to obtain the consent of the other maritime Powers to a qualified right of search in time of peace. On April 7, 1862, during the Civil War, Secretary of State Seward, evidently desiring to conciliate the British government, signed a treaty for the suppression of the slave trade, which provided, among other things, that the United States and Great Britain should have a mutual right of search. Consult: Eugene Schuyler, *American Diplomacy* (6th ed., by J. B. Atlay, New York, 1886); J. B. Moore, *Digest of International Law* (Washington, 1907); W. E. Hall, *A Treatise on International Law* (London, 1909). See INTERNATIONAL LAW; WAR.

SEARCHER. See GROUND BEETLE.

SEARCHLIGHT. The electric searchlight consists of an electric arc mounted in the focus of a parabolic mirror. The mirror receives the rays which diverge from the lamp and by virtue of the properties of a parabola reflects them in a direction parallel to the axis. The searchlight casing consists of a thin metal cylinder, blackened inside to prevent interference of light by reflection, from 12 to 108 inches in diameter and of slightly greater length. It is supported on trunnions, or pivots, to give it motion in the vertical plane, and the arms carrying the pivots are secured to a pivoted horizontal plate which permits lateral movement. The feeding in the lamp is generally automatic, though hand feed is also provided. The light may be trained by hand or by a searchlight controller located at a distance from the light. If reliable in its operation, the controller is to be preferred, as it is difficult for the operator to see objects illuminated by the rays when he is near the light. The earliest practicable searchlights were designed by a Frenchman, M. Mangin. In the earliest models the carbons of the lamps were nearly vertical, but in more recent types they are horizontal, as this arrangement permits the crater formed in the carbon to give its full brilliance to reflection and prevents irregular feeding from displacing the incandescent arc from the optical axis of the mirror. In addition to their employment for naval war purposes and in coast defenses, siege operations, and trench warfare on land, searchlights have a wide use in navigation. All large ocean and river steamers are fitted with them. On the Western rivers of the United States they have greatly simplified the problem of navigation at night. See COAST DEFENSE; PROJECTION APPARATUS.

SEARCH OF TITLE. In law, a search in the various public offices where instruments which may affect the title to real estate are recorded, in order to determine whether a person has a good record title to real property. If there have been any proceedings involving the transfer or division of the property, such as a partition, the searcher must look up the records of the proceedings and determine whether they were regular and whether they included all necessary parties, etc. The memorandum of the results of the search is called an "abstract of title." A search for conveyances and mortgages is always made for at least 20 years back, as that is the period required formerly in England and now in most of the United States to gain title to land by adverse possession. In some cases a complete chain of title from the original grant by the crown or state to the date of the conveyance is essential to insure the complete validity of the title. An attorney who searches a title for a client is responsible for any damages which may result from a defective title, if the defect was a matter of record and the attorney failed to find and report it. See ABSTRACT OF TITLE; RECORDING OF DEEDS; RECORDS, PUBLIC; ETC.; and consult the authorities referred to under ABSTRACT OF TITLE and REAL PROPERTY.

SEARCH WARRANT. A warrant or mandate of a court of competent jurisdiction, usually a magistrate's court, addressed usually to the sheriff or a constable, requiring him to search a house or place named in the warrant for property alleged to have been stolen. The warrant requires the officer serving it to seize the property if found and the person named in the warrant and to bring both before the court issuing the writ. By a gradual relaxation of practice the use of the search warrant was early adopted by the common-law courts, and by modern statutes its use has been extended to the search for and seizure of intoxicating liquors, gambling implements, counterfeiters' tools, burglars' tools, smuggled goods, obscene literature, and generally all articles the bare possession of which is made a crime. The mere redress of a private wrong, however, has never been considered sufficient to justify the use of this mandate. The use of the search warrant was before the nineteenth century subject to many grave abuses, not only because of its use as a means of securing evidence of political offense, but as a means of securing evidence of crimes chiefly important because of their semipolitical character, as in the case of the use of writs of assistance (which were really forms of search warrants) in the American Colonies before the outbreak of the Revolution. The final overthrow of these abuses was brought about in the reign of George III, and it is now established that by the common law a search warrant can be issued only on oath or affirmation showing probable cause. It is required to specify definitely the place in which the search is to be made and the property to be seized. If the officer executing the warrant does not comply with its terms, he is civilly liable for all his acts not authorized by it and may be compelled to respond in damages for trespass or assault or both, but if strictly obeying the warrant the officer may break outer or inner doors after demand is made for admittance, and his act is justified by his writ whether he succeeds or not in finding that for which he makes search. The United States Constitution (Fourth Amendment) contains a provision prohibiting the oppressive use of the search warrant, and this provision has been enacted in substantially the same form in all of the State constitutions. This amendment does not operate as a prohibition upon the governments of the several States, but the corresponding provisions of State constitutions have received a similar interpretation.

See CONSTITUTIONAL LAW; CRIMINAL LAW; PROCEDURE; and consult the authorities there referred to.

SEA ROBIN. A name often given to certain marine fishes of the family Cottidæ (q.v.), but more properly applied to the spiny fishes of the family Cephalacanthidæ. As the name implies, these fish possess enlarged and powerful pectoral fins, which, with the often brilliant coloring and many spines, give a fanciful likeness to a bird. They are common along rocky coasts in the waters of the Northern Hemisphere. See GURNARD; SCULPIN.

SEARS, BARNAS (1802–80). An American educator and theologian, born at Sandisfield, Mass. He graduated at Brown University in 1825, studied at the Newton Theological Seminary, and in 1831 became a professor at Madison University. In 1833 he went to Germany, and after pursuing studies at Halle, Leipzig, and Berlin accepted the professorship of theology at the Newton Seminary, of which he became president. In 1848 he was made secretary and executive agent of the Massachusetts Board of Education. From 1855 to 1867 he was president of Brown University. Afterward he acted as general agent of the Peabody Education Fund for the Southern States. He edited the *Christian Review*, contributed to the *Bibliotheca Sacra*, and wrote a *Life of Luther* (1850) and many pedagogical and educational treatises.

SEARS, EDMUND HAMILTON (1810–76). An American Unitarian clergyman and poet, born at Sandisfield, Mass. He graduated at Union College (1834) and at Harvard Divinity School (1837), and held pastorates in Massachusetts at Wayland (1839–40), Lancaster (1840–47), and Weston (1865–76). Between 1847 and 1865 he edited the *Monthly Religious Magazine*. His publications include: *Regeneration* (1853; 9th ed., 1873); *Pictures of the Olden Time* (1857); *Christian Lyrics* (1860); *Athanasia* (1860); *The Fourth Gospel: The Heart of Christ* (1872); *Sermons and Songs of the Christian Life* (1875).

SEARS, ISAAC (1729–86). An American patriot, one of the leaders of the Sons of Liberty (q.v.) in New York. He was born in Norwalk, Conn., but removed to New York City. He commanded a privateer, and in 1758–61 cruised against the French, but lost his vessel by shipwreck. He then engaged in the European and West Indian trade. In the early disputes between the colonists and the British government he allied himself with the more radical element of the Patriot party in New York and during the opposition to the Stamp Act (q.v.) as well as afterward was one of the leaders of the Sons of Liberty. He was a member of the Committee of Fifty-One in New York in 1774 and of the Committee of One Hundred in 1775, led a company of Connecticut light horse into New York City later in 1775 and destroyed the press of Rivington's Loyalist *New York Gazetteer* (see RIVINGTON, JAMES), was appointed deputy adjutant general with the rank of lieutenant colonel by Gen. Charles Lee in 1776, and was a member of the State Assembly in 1783. He was commonly known as King Sears.

SEARS, LORENZO (1838–1916). An American literary historian and biographer, born at Searsville, Mass. He graduated at Yale in 1861 and at the General Theological Seminary, New York, in 1864. He was rector of various parishes in New England until 1885, was professor of rhetoric and English literature at the University of Vermont (1885–88), and at Brown was professor of rhetoric (1890–95) and professor of American literature (1895–1906). His writings include: *The History of Oratory* (1896); *Principles and Methods of Literary Criticism* (1898); *American Literature in its Colonial and National Periods* (1902); *The Makers of American Literature* (1904); *Wendell Phillips* (1909); *John Hancock* (1912); *John Hay* (1914).

SEARS, TABER (1870–). An American mural painter and designer of stained glasses. He was born in Boston, Mass., and studied at the Boston Museum school and then in Paris under Constant, Laurens, and with Olivier Merson. After further studies in Florence and Rome he returned to the United States, settling in New York. Among his best-known mural paintings are those in the Buffalo Historical Society, the City Hall, New York, Epiphany Church, Pittsburgh, and the Bankers Trust Company, New York. Various churches in Cincinnati, Philadelphia, and Plainfield, N. J., possess good examples of his stained glasses. As vice president of the Architectural League of New York and treasurer of the National Society of Mural Painters, Sears took a prominent part in the activities of these societies.

SEA SERPENT. An imaginary marine creature supposed to be of snakelike form and nature and of huge size and pelagic habits. Many so-called sea serpents have been shown to be floating gigantic seaweeds or strings of porpoises following one another in Indian file. The ribbon fish (*Regalecus*) is perhaps responsible for some; giant squids or chains of ascidians may explain others. The supposition that some of the marine saurians of past ages may survive in the depths of the sea and occasionally appear at the surface is not scientifically credible. Consult A. Wilson, *Leisure-Time Studies* (London, 1878), and A. C. Oudemans, *The Great Sea Serpent: An Historical and Critical Treatise* (ib., 1893). See OARFISH.

SEA'SHORE. The space of land adjoining the sea and covered at high tide and bare at low tide. By the English common law the seashore belongs to the crown, subject to the public rights of fishing on it, of digging for clams, and of landing, loading and unloading, etc., for purposes of navigation. In the United States the seashore belongs generally to the States in whose dominion it lies, though in some States (as Massachusetts, New Hampshire, Maine, and Virginia) it is the property of the owner of the upland. In other countries, as in England, the owner of the upland or any other person or corporation may, by grant from the crown or the state, become the owner of the shore. In any case, however, the state may make such reasonable regulations as to its use by the public as are not inconsistent with federal laws. However, the public have the right of fishing on the seashore and gathering various forms of shellfish thereon, and this right cannot be interfered with by private owners. Consult J. K. Angell, *Treatise of the Right of Property in Tide Waters and in the Soil and Shores thereof* (2d ed., Boston, 1847), and authorities under RIVER, NAVIGABLE.

SEASHORE, CARL EMIL (1866–). An American psychologist, born at Mörlunda, Sweden. He graduated in 1891 from Gustavus Adolphus College and in 1895 from Yale

(Ph.D.), where he was an assistant in psychology in 1895–97. At the State University of Iowa he was assistant professor of philosophy from 1897 to 1902, thereafter professor of psychology, head of the department of philosophy and psychology after 1905, and dean of the Graduate College after 1908. Seashore invented a voice tonoscope, spark chronoscope, psychergograph, audiometer, sound perimeter, multiple recorder, and other psychological instruments. He was editor of the *University of Iowa Studies in Psychology*, joint editor of the *Journal of Educational Psychology*, and consulting editor of the *Psychological Review*. The Western Philosophical Association chose him its president in 1909, and the American Psychological Association elected him to the same office in 1911. His publications include: *Elementary Experiments in Psychology* (1908); *Psychology in Daily Life* (1913).

SEASICKNESS. A reflex nervous affection characterized by nausea, vomiting, and extreme prostration, produced in susceptible individuals by the motion of a ship at sea. Premonitory symptoms of vertigo, headache, and distress and sinking at the pit of the stomach appear almost immediately after a susceptible person is exposed, aboard a vessel, to the motion of rolling water. Vomiting of a convulsive character soon comes on, with such an overwhelming prostration as to render the patient utterly regardless of what is going on about him and almost indifferent to life. A deadly pallor, a profuse cold sweat, and diarrhœa are commonly present. Susceptibility to seasickness varies greatly in different persons, and the same individual may exhibit varying degrees of susceptibility at different times. Children and aged persons possess comparative immunity from seasickness, and women as a rule suffer more than men.

The primary cause of seasickness is the motion of the vessel, and the pitching, or alternate rising of the bow and stern, is especially apt to induce it. In some persons other regular oscillatory movements bring on a very similar condition; the motion of a swing, a railway train, or even a carriage is enough to provoke nausea and vomiting in these individuals. The exact manner in which such causes produce seasickness is not definitely settled. It is now generally believed to be by a reflex disturbance of the nervous system due to the violent and unusual stimulation of the organs of special sensation concerned in maintaining the equilibrium of the body, particularly the semicircular canals of the ear, the eyes, the diaphragm, and also of the abdominal viscera, especially the stomach. Very probably no one cause is operative in any case. Some cases seem to be primarily of gastric origin, others purely psychical or nervous. It has been suggested that the attack is due to a congestion or hyperæmia of the nerve centres in the spinal cord which are related to the stomach and the muscles concerned in vomiting.

The remedies which have been suggested and used for seasickness are innumerable, but there is none which can be relied upon. Some persons are benefited by a preliminary course of calomel and a light diet for several days before sailing. Small doses of the bromides may be taken for a few days before embarking. A laxative pill at night for the first two or three days of the voyage is also beneficial, together with a simple diet and avoidance of fluids. If in spite of precautions the attack comes on, the patient should at once go to bed and stay there for a day or two or until the attack subsides. A belladonna plaster over the nape of the neck and one of mustard, spice, or capsicum over the epigastrium will sometimes keep all symptoms in abeyance. The surface temperature should be kept up with hot-water bottles if necessary. Vomiting may be combated by taking pieces of ice, iced champagne, ginger ale, or a few drops of brandy; these are better than the hot broths or beef tea usually given. Cocaine in small doses by the mouth is a valuable agent to control severe vomiting. Hyoscyamus has been used successfully. The most generally reliable remedy is a hypodermic injection of morphine and atropine. Headache and nausea are often amenable to bromocaffein or similar preparations. Chloral, the bromides, antipyrine, nitroglycerin, and amyl nitrite are also useful in certain cases. If the onset of the sickness is not sudden and severe, a determined effort to breathe regularly and not in rhythm with the motion of the ship will often overcome the spasmodic muscular contractions and the tendency to vomit. Compression of the abdomen by a broad tight belt will sometimes give relief. Lastly, the patient should not remain too long below deck. All unpleasant symptoms will sometimes quickly vanish on a return to the fresh air and sunshine. See VOMITING.

SEASIDE GRAPE (*Coccoloba uvifera*). A small West Indian tree of the family Polygonaceæ, which grows on the seacoasts; also known as uvera, uva del mar, sea plum, pigeon plum, etc. It attains a height of 20 feet or more; has leathery, shining, entire leaves and a pleasant, subacid, edible fruit, half an inch in diameter, somewhat resembling a currant, formed of the pulpy calyx investing a bony nut. The wood is heavy, hard, durable, and beautifully veined, and when boiled yields an astringent red coloring matter, sometimes called Jamaica kino.

SEASIDE SPARROW. One of several small conspicuously streaked marsh sparrows constituting the genus *Ammodramus*, or better *Passerherbulus*, and found numerously in four species in the eastern United States, specifically *Passerherbulus maritimus*. The sharp-tailed and Henslow's sparrows are others.

SEA SLUG. A shell-less creeping mollusk of the nudibranchiate group. (See NUDIBRANCHIATA, and Colored Plate there.) The term is also sometimes applied to holothurians (q.v.).

SEA SNAIL. A fish of the family Liparididæ, consisting of small sluggish, goby-like

SEA SNAIL.
a, a North Atlantic sea snail (*Liparis liparis*); *b*, its sucking disk.

fishes of Arctic and Antarctic seas, which creep about the rocks at various depths, adhering to

them by a ventral sucking disk (see illustration), formed of the modified ventral fins. They feed upon both vegetable and animal substances.

SEA SNAKE. One of the poisonous marine snakes of the elapine subfamily Hydrophidæ. They are from 2 to 4 feet long and have the tail and sometimes the entire body compressed vertically in adaptation to their swimming life. They are absolutely aquatic and die when kept long out of the water, though they go ashore to bear their young, which are born alive and are guarded by the mother for a period. They cast their skins piecemeal. These serpents are found in about 50 species of several genera, from the Persian Gulf to the Philippines (casually to Japan) and also on the coast of Central America. They abound, sometimes in schools, in the estuaries and tidal waters and are often met with far from land; while one species (*Distira semperi*) is confined to the landlocked Lake Taal in Luzon. One of the well-known species of the Bay of Bengal is the kerril (*Distira jerdoni*). These serpents feed upon fish and are extremely poisonous and very dangerous to fishermen, pearl divers, and bathers in certain regions. Most of them are dull brownish or greenish in color, but others are brilliantly colored, as in the case of the Indian species (*Hydrophis nigricincta*) figured on the Colored Plate of Foreign Venomous Serpents with the article Snake. Consult Fayrer, *Thanatophidia of India* (London, 1874), and G. A. Boulenger, in *Natural Science*, vol. i (ib., 1892).

SEASONING VEGETABLES. See Herbs, Culinary; Vegetables.

SEASONS (Fr. *saison*, from Lat. *satio*, a sowing, from *serere*, to sow; connected with Eng. *sow*). Divisions of the year based upon climatic conditions. The changes of the seasons are due to two causes: (1) the inclination of the earth's axis of rotation to the plane of the ecliptic (q.v.); (2) the varying length of the day as compared with the night, resulting from the inclination of the axis. As a result of the first of these causes the sun's rays fall more obliquely on the earth in the winter than in the summer. The number of rays striking a surface varies as the sine of the angle of inclination. Thus, the greater the obliquity the less the number of rays. In the summer the sun rises to a greater elevation each day than at other seasons, and therefore the number of rays falling on the earth's surface in that season will be greater than in the winter. The second cause is obvious. Since the heat of the earth is due primarily to solarization, it follows that the hot season should occur when the days are longest. Within the tropics the difference in the obliquity of the sun's rays is never so great as to make one part of the year very sensibly colder than another. There are, therefore, either no marked seasons, or they have other causes altogether and are distinguished as the wet and dry seasons. (See Rain.) But in the temperate zones the year is naturally divided into four seasons: spring, summer, autumn, and winter. In the Arctic and Antarctic regions spring and autumn are very brief, and the natural division of the year is simply into summer and winter, and this is very much the case also in regions of the temperate zones lying near the Arctic and Antarctic circles. In subtropical regions the distinction of four seasons is in like manner very imperfectly marked. This distinction is everywhere somewhat arbitrary as to the periods of the year included in each season, which really vary according to latitude and partly according to the other causes which influence climate (q.v.), the seasons passing one into another more or less gradually, and their commencement and close not being determined by precise astronomical or other phenomena. The greatest heat of summer is never reached till a considerable time after the summer solstice (q.v.), when the sun's rays are most nearly vertical and the day is longest; the greatest cold of winter is in like manner after the winter solstice, when the day is shortest and the sun's rays are most oblique. The reason in the former case is that as summer advances the earth itself becomes more heated by the continued action of the sun's rays, and in the latter, that it retains a portion of the heat which it has absorbed during summer, just as the warmest part of the day is somewhat after midday, and the coldest part of the night is towards morning.

SEASONS, The (Die Jahreszeiten). An oratorio by Haydn (q.v.), first produced in Vienna, April 24, 1801; in the United States, April 28, 1875 (Boston).

SEASONS, The. A descriptive poem in blank verse by James Thomson. *Winter* appeared in 1726, *Summer* 1727, *Spring* 1728, and *Autumn* 1730, and a revised and enlarged edition in 1744.

SEA SPIDER. See Pantopoda.

SEA SQUIRT. Any of several marine animals which have the power of ejecting water when removed from their native element. In the West Indies the large holothurians (q.v.) which eject water from the respiratory trees through the anal opening are often so called. The name is more commonly and rather more properly applied to the larger ascidians (q.v.), which force the water out of the atrial cavity through the atrial pore by the contraction of the tunic, often with considerable velocity and for many inches.

SEA SURGEON. See Surgeon Fish.

SEA SWALLOW. A small gull or tern (qq.v.).

SEATH, John (1844–). A Canadian educator. He was born at Auchtermuchty, Fifeshire, Scotland, and was educated at Glasgow University and at Queen's College, Belfast, where he graduated with high honors in 1861. He went to Canada, taught until 1884, when he became provincial inspector of high schools and collegiate institutes, and in 1906 he was appointed Superintendent of Education for Ontario. He also became a member of the Ontario Educational Advisory Council and in 1909 visited Europe and made a valuable report upon the technical schools of Germany, France, and other countries. In 1902–03 he was president of the Ontario Educational Association.

SEATON, Sir John Colborne, first Baron (1778–1863). A British soldier and colonial administrator, born at Lyndhurst, Hants. He became an ensign in 1794 and captain in 1800 and served in Egypt (1801) and in Sicily (1806). In 1808–09 he was secretary to Sir John Moore, in accordance with whose dying request Colborne was made a lieutenant colonel. He commanded a brigade in the Peninsular War (1810–14) and at Waterloo led the Fifty-second Light Infantry in the victorious charge against the Old Guard. In 1825 he was promoted major general and in the same year was made Lieutenant Governor of Guernsey. He

was Lieutenant Governor of Upper Canada in 1829–38, put down the revolt in Lower Canada in 1838, was appointed Governor-General the same year, returned to England and was made peer in 1839. In 1829 he founded Upper Canada College, Toronto, on the model of the English public school. He was Governor of the Ionian Islands in 1843–49, was promoted to full general in 1854, served as commander in chief of Ireland in 1855–60, and was made field marshal in 1860.

SEATON, William Winston (1785–1866). An American journalist, born in King William Co., Va. From 1812 until 1860 he was, with his brother-in-law, Joseph Gales, proprietor of the *National Intelligencer* at Washington, D. C. From 1812 until 1820 the two were the only reporters of congressional proceedings. Their *Annals of Congress, Debates and Proceedings in the Congress of the United States from 3 March, 1703, till 27 May, 1824* (42 vols., 1834–56), and their *Register of Debates in Congress from 1824 till 1837* (29 vols., 1827–37) are sources of the utmost importance on the history of the times.

SEA TROUT. One of various fishes, as (1) the weakfish (q.v.), and (2) in Great Britain the trout (*Salmo trutta*).

SEATTLE, sē-ăt″l. The largest city of Washington, a port of entry and the county seat of King County, on the east shore of Puget Sound, 864 miles by water north of San Francisco, Cal. (Map: Washington, C 3). It is a terminal point for eight transcontinental railways, four of which (the Great Northern, Northern Pacific, Chicago, Milwaukee, and St. Paul, and the Union Pacific-Oregon-Washington) enter the city upon their own rails. Other railways have traffic arrangements with these lines, while the Canadian Pacific and Grand Trunk make connection by water, the former also by rail. Two electric interurban lines and one short local railway, the Columbia and Puget Sound, also enter the city. There is regular steamship connection with all parts of the world by the transpacific and Panama Canal routes.

The city is situated between the Cascade and Olympic mountain ranges, with Puget Sound on the west front and Lake Washington to the east. Within the city limits lie Lake Union and Green Lake. More than 11,000,000 cubic yards of earth have been removed by recent regrading operations. Business and manufacturing quarters occupy levels near the sea, while the finer residential districts crown the hills. The city has excellent drainage, a pure water supply, and an extensive sewerage system. The death rate is only 8.1 per 1000 population. The principal streets are paved with asphalt, brick, granite, or wooden blocks, the total length of paved streets being 221 miles.

The park and boulevard system comprises 1803 acres, 20 improved playgrounds, 21 miles of scenic boulevards, a public bathing pavilion, and an observation pier. The principal parks are Woodland, Ravenna, Kinnear, Madrona, Volunteer, Washington, and Jefferson. The campus of the University of Washington, covering 355 acres, is within the city. Buildings worthy of notice are the cathedral of St. James, Providence Hospital, the University of Washington group, Federal Building, the Y. W. C. A., the Rainier Club, and the Public Library. Of the many tall business blocks located in the heart of the city, the L. C. Smith Building, 38 stories high, is the most imposing. The chief theatres are the Metropolitan and the Moore.

Commercially Seattle is one of the foremost cities of the Pacific coast. It has a tributary region rich in timber, fisheries, mineral, and agricultural resources, which, combined with exceptional transportation facilities, have tended to centralize the commerce of the Northwest at this point. The opening of the Alaska gold fields brought about a remarkable development of trade with that rapidly growing territory. More recently commerce with the Orient has also assumed importance, because the distance between the Asiatic ports and Seattle is considerably shorter than routes which terminate in ports farther south. The Port Commission, an elective body legally established in 1911, has so far been authorized to expend $6,300,000 in harbor and water terminal improvements to provide cheap and adequate facilities for handling this oversea trade. Of this amount about $5,000,000 has been spent in the construction and operation of public docks, warehouses, ferries, cold-storage plants, and other equipment. To provide a new fresh-water harbor area, the United States government with the aid of State and county funds has, at a cost of approximately $3,275,000, nearly completed a ship canal connecting Puget Sound with Lakes Union and Washington. This canal is wholly within the city, 8½ miles long, and of sufficient width and depth to accommodate the largest merchant and war vessels. The total commerce of the port (foreign, coastwise, and local) for 1915 amounted to $257,792,393. The main articles of export were lumber, wheat, cotton, canned goods, flour, hardware, and machinery. Imports are principally of general merchandise, the largest item for 1914 being raw silk to the value of $20,000,000. Seattle is one of the chief centres of the country for the receipt and shipment of gold. The United States Assay Office, established here in 1898, has since its beginning received about $235,000,000 worth of gold.

Though Seattle is primarily a commercial city, manufacturing interests are steadily becoming more important. In 1914 there were 751 establishments employing more than 14,000 persons, the value of whose output was $50,569,000. Lumber and lumber products, flour, foundry and machine-shop products, meat, dairy products, furniture, and leather goods are the principal commodities among the many which are produced. Shipbuilding also is a very important industry. Most of the power for manufacturing and other purposes is developed at hydroelectric plants located on various rivers in the Cascade Mountains. The municipal plants are capable of supplying 23,000 kilowatts, while the supply from other sources is approximately 70,000 kilowatts. The water supply is owned and operated by the municipality. It has its source in Cedar River, 28 miles distant, at a considerable altitude, and thence it is conveyed to the city in two supply mains discharging 67,000,000 gallons per day into reservoirs capable of storing 270,000,000 gallons. This water has practically no mineral or other impurity.

The government is vested in a mayor, biennially elected, and a council of nine members, elected at large for a term of three years, three being elected annually. Administrative offices include the treasurer, comptroller, and corporation counsel, also the following departments: board of public works (consisting of the city engineer and superintendents of public utilities, water, streets, buildings, and lighting), police, fire, civil service, health, parks, and library. The

SEATTLE

VOLUNTEER PARK (UPPER)
SEATTLE HARBOR AND OLYMPIC MOUNTAINS (LOWER)

public schools are controlled by a board of education which is not connected with the municipal government. The school system comprises 6 high schools and 66 grade schools, with a total enrollment of 36,087 pupils in 1914. It represents an investment valued at more than $6,000,000. The University of Washington, supported by the State, is the largest institution for higher education in the Northwest. (See WASHINGTON, UNIVERSITY OF.) The public library with its nine branch libraries has a valuation in buildings and grounds of about $1,100,000. In 1915 the libraries contained about 265,000 volumes and had 63,855 registered borrowers, with a total circulation of 1,335,852 volumes.

Seattle, named for a local Indian chief, was first settled in 1852, laid out as a town in 1853, withstood an Indian attack in 1856, was incorporated in 1865, and reincorporated as a city in 1869. Railroad connections were not established with the East until 1883. In 1889 the business district of the city was almost entirely destroyed by fire. The first shipment of gold from Alaska was received in 1897. Since then the growth of the city has been continuous and rapid. Pop., 1860, about 200; 1870, 1107; 1880, 3533; 1890, 42,837; 1900, 80,871; 1910, 237,194; 1915, 321,931; 1920, 315,652. From June 1 to Oct. 16, 1909, the Alaska-Yukon-Pacific Exposition, having for its object the exploitation of Alaskan resources and those of the countries bordering on the Pacific, was held in Seattle. A site covering 250 acres, included within a portion of the campus of the University of Washington, consisted of a narrow peninsula between Lake Washington on the east and Lake Union on the west. The principal buildings were grouped on either side of a terraced court at the summit of which was the United States Government Building, with a great dome 270 feet high. Seven of these buildings, devoted respectively to Fine Arts, Auditorium, Machinery, Forestry, Washington State, Arctic Brotherhood, and Women, were of permanent structure and at the close of the exposition became the property of the University of Washington. The exposition involved an expenditure of approximately $10,000,000 and was attended by 3,740,600 persons. A statue of William H. Seward, commemorating his share in the Alaska purchase, was one of the permanent memorials of the exposition. Consult Seattle Port Commission, *Yearbook* (Seattle), and Welford Beaton, *A City that Made Itself* (ib., 1914).

SEA UNICORN. See NARWHAL.

SEA URCHIN. The name applied to species of the echinoderm class Echinoidea. The sea urchin of the coast north of Cape Cod (*Echinus*, or *Strongylocentrotus, drobachiensis*) is common among rocks, ranging from low-water mark to 50 or more fathoms. It eats seaweeds and is also a scavenger, feeding on dead fish and the like. Certain kinds are known to bore for a little way into limestone rocks or coral reefs, where they are protected from the waves. Sea urchins have scattered over the surface, among the spines, microscopic button-like bodies, called sphæridia, which are thought to be organs probably of taste or smell. They evidently react to odors. The eggs are numerous and small. After hatching the young sea urchin enters the free-swimming larval or pluteus stage, passing through a complicated metamorphosis. On the other hand, certain forms (*Anochanus sinensis*) have a direct development, the larval stage being suppressed. A Chilean form and also a South Pacific species of *Hemiaster* carry their young in brood pouches, and they also directly develop, for no pluteus sea-urchin larvæ were captured by the *Challenger* expedition in the Southern Ocean. The *cake urchin*, a name locally given to certain members of the Clypeastrea, is the flattened sea urchin or dorsoventrally thickened sand dollar. The large sea urchin of the Mediterranean is an article of food, and the Indians of the northwest coast eat the large local species. See ECHINOIDEA; ECHINODERMATA.

SEA-WATER THERAPY, THALASSOTHERAPY. The beneficial influence of sea bathing is generally recognized. Its tonic effects are due partly to the action of the water itself and its solid ingredients, its motion, and to the exposure of the body to the air and sunlight. By these means the cutaneous nerves are stimulated. As a therapeutic measure sea bathing must be carefully regulated and adapted to the individual. Patients most benefited are those having a tendency to profuse perspiration and those who take cold easily. In scrofulous subjects there is an alterative as well as a tonic influence, but it is difficult to decide whether this is primarily due to the sunlight, the sea air, or the bathing itself. Functional nervous diseases, certain cases of muscular rheumatism and arthritis are also much benefited. On the other hand, patients having marked heart diseases or diseases of the blood vessels and lungs, angina pectoris, organic affections of the nervous system, diseases of the liver or other abdominal viscera, and epilepsy, should avoid open sea bathing except under the most careful supervision. The same statement applies to elderly persons. Weakly individuals in any case should not remain in the water longer than two to five minutes, should have a brisk rubdown immediately after the bath, and a hot drink and extra wraps until reaction sets in. Sea bathing may also be taken in quiet water; and when the sea is not available, warm baths of sea water, either tub baths or swimming pools, have a similar effect.

Injections of sea water have been highly extolled by the French physicians for their tonic and alterative action. Diarrhœal diseases, in infants especially, are said to be rapidly cured. The water is taken from the deep sea, away from the shore, sterilized and kept in sealed glass containers and injected into the loose abdominal tissues, buttocks, or between the shoulder blades, in doses adapted to the individual case. American physicians, however, look upon this method of treatment with a certain degree of skepticism and do not consider that sea water is in any way superior to ordinary normal saline solution. Consult J. R. Day, *Sea Water Treatment* (London, 1914).

SEAWEED, or **SEAWARE.** In a wide sense any plant of the class Algæ which lives in the sea. The term is also applied to any plant growing in the sea. Several species are edible, the most important of these being Irish or carrageen moss, used as a cattle food and also in the preparation of jellies (blanc mange and similar dishes). Dulse, or dillesk, and kelp, or tangle, are also used to a limited extent as human food. The name rockweed is given to certain species that attach themselves to rocks.

Eel grass has been used in filling mattresses, cushions, etc., and in sheathing houses. Seaweed ashes formerly supplied much of the alkali

that was used in soap and glass making and for the preparation of iodine and was used as a fertilizer. (See KELP.) As a rule, however, cheaper sources of most of the materials furnished by seaweed have been discovered. The principal use of seaweed is as a manure, for which purpose it is employed to some extent on many coasts, some of the best farms of New England being maintained very largely by the use of seaweed. The potash of seaweed, which is probably its most important fertilizing constituent, is subject to wide variation. Fresh seaweed often contains 1 to 2.5 per cent of this constituent, but it is soluble and is rapidly lost if the weed is subjected to washing. The lime is also very variable, owing to the adherence of shells, etc., but normally it is probably less than 1 per cent. It may be dried and applied in this way, the air-dried seaweed containing 11 to 12 per cent potash and 1.2 per cent nitrogen.

Seaweed belongs to the same class of manures as barnyard manure and green manures and, like them, proves valuable on porous, sandy soils. It differs from average barnyard manure in its higher percentage of potash and lower percentage of phosphoric acid. While, like barnyard manure, it is a general fertilizer, it is not so well balanced. Hence bone or other phosphatic fertilizer should be applied with it. An advantage it has over barnyard manure is its freedom from weed seeds, insects, etc. Since it contains soluble potash, it is considered a potassic manure especially valuable for crops like potatoes, clover, etc., which are potash feeders.

Seaweed may be applied fresh as a top-dressing (on grass) or may be plowed in. By its rapid decomposition, especially of the more succulent and mucilaginous kinds, seaweed furnishes a valuable means of starting fermentation in manure, compost heaps, peat, etc. The objections to the use of seaweed ashes as a fertilizer are the difficulty and expense of burning and the loss of nitrogen. Seaweed, when applied in the spring, has been found to injure the quality of potatoes, probably on account of the chlorine it contains. It also apparently delays maturity as compared with barnyard manure. It seems, however, to reduce scab when applied at planting. Undoubtedly the safest practice with potatoes and other plants injured by chlorine is to apply the seaweed the previous summer or fall. Consult: F. H. Storer, *Agriculture in Some of its Relations with Chemistry* (7th ed., 3 vols., New York, 1897); United States Department of Agriculture, *Farmers' Bulletin 105* (Washington, 1899); "Fertilizer Resources of the United States," in *Senate Doc. 190*, 62d Cong., 2d Sess. (ib., 1914); F. K. Cameron, "Potash from Kelp," in *United States Department of Agriculture, Annual Report, 100* (ib., 1915); J. S. Burd, "Economic Value of Pacific Coast Kelps," in *California Agricultural Experiment Station, Bulletin 248* (Berkeley, 1915).

SEAWELL, sē'wĕl, MOLLY ELLIOT (1860–1916). An American author. She was born in Gloucester Co., Va., Oct. 23, 1860, and began to write at an early age. She published her first novel in 1889, but attracted wider public attention in the following year by *Little Jarvis*, a story for boys. Perhaps the most noteworthy of her novels is *The Sprightly Romance of Marsac* (1896), a lively tale constructed on a French model. Other books of hers are: *Paul Jones* (1892); *A Virginia Cavalier* (1896); *Gavin Hamilton* (1899); *Fifi* (1903); *The Victory* (1906); *The Ladies' Battle* (1911); *The Diary of a Beauty* (1915). Her *Maid Marian* she dramatized in 1894 and *Marsac* in 1900.

SEB, or KEB. An Egyptian deity, identified by the Greeks with Cronos. (See SATURN.) He was the son of Shu and Tefnut and the brother as well as the husband of Nût (q.v.) and is sometimes called the father or leader of the gods, since he was the father of Isis, Osiris, Typhon, and Nephthys. Seb was the earth god and as the character of the god of the surface of the earth had an important part in the mythology of the underworld, while as god of the earth under the surface he was an authority over the tombs. Consult E. A. T. Wallis Budge, *The Gods of the Egyptians*, vol. ii (Chicago, 1904).

SEBA'CEOUS CYST. See WEN.

SEBAL'DUS (?–801). A saint in the Roman Catholic church and one of the patron saints of Nuremberg. He is said to have been the son of a Danish king. He studied in Paris and, according to the tradition, married a daughter of King Dagobert III, but on the day following their marriage the vows were dissolved, and for the ensuing years Sebaldus was a stern ascetic and lived as a hermit in a forest near Nuremberg. The church in Nuremberg where he is buried, formerly St. Peter's, is now known as St. Sebaldus'. It contains a splendid monument to him, wrought by Peter Vischer (q.v.). He was canonized by Pope Martin V in 1425. The day of his death, August 19, is still commemorated in Nuremberg.

SEBAS'TE. See SAMARIA.

SEBAS'TIAN (Portug. **SEBASTIÃO**), DOM (1554–78). King of Portugal from 1557 to 1578. He was the posthumous son of the Infante John and succeeded his grandfather John III on the throne, under the guardianship of his grand-uncle the Cardinal Henry. Ambitious of a conqueror's fame and desiring also to further the spread of Christianity in northern Africa, Sebastian took advantage of the internal disputes raging in Morocco to invade that country in the summer of 1578, but on August 4 the Portuguese army was almost annihilated at Kasr el Kebir (Alcazar Quivir) by the forces of the Sherif Muley-Malek. Sebastian was among the slain. Although his body was identified before burial on the field of battle, and the burial place so marked that reburial at Ceuta and transportation (1582) to Lisbon were possible, many Portuguese refused to believe in his death, and Sebastianism developed the belief that he would return at some future time to rule his people. This gave occasion for the appearance of several pretenders, claiming to be the missing King, the most prominent of whom made himself known at Venice in 1598, and after a career of two years fell into the hands of the Spaniards, who probably put him to death. Consult Diogo Barbosa Machado, *Memorias para a historia de Portugal, que comprehendem o governo del rey Dom Sebastião* (4 vols., Lisbon, 1736–51), and Miguel Martins Dantas, *Les faux Don Sébastien* (Paris, 1866).

SEBASTIAN (Lat. *Sebastianus*), SAINT. A celebrated martyr of the early Church. His history is contained in the *Acta Sancti Sebastiani*, which probably dates from the close of the fourth century, but many elements in the tradition are doubtless unhistorical. Sebastian, according to this narrative, was born at Narbonne in Gaul and educated at Milan. Although a Christian, he entered the Roman army without revealing

his religion and with the view of assisting and protecting the Christians in persecution. He rose to high favor under Diocletian and became commander of the first cohort at Milan. When his religion was discovered, he was condemned to death in Rome by a troop of Mauritanian archers, who transfixed him with numberless arrows and left him as dead. But a Christian lady, Irene, finding that life was not extinct, had the body removed to her house, where life was restored; and although the Christian community desired to conceal his recovery, Sebastian again appeared in public before the Emperor to profess his faith in Christianity. Diocletian condemned him to be beaten to death with clubs in the amphitheatre, and his body was flung into one of the sewers of the city, in which it was discovered, according to the *Acta*, by means of an apparition and carried by a Christian lady, Lucina, to the catacomb which is still called by his name. The date of his martyrdom was Jan. 20, 288, and this is his feast day with the Latins. By the Greeks the feast is held on the 18th of December. The festival was celebrated with great solemnity in Milan as early as the time of St. Ambrose, and it was observed in the African church in the fourth century. Sebastian is patron saint against the plague. It is related that in 680 a great pestilence in Rome ceased when an altar was dedicated to him in the church of St. Eudocia. The martyrdom of St. Sebastian is one of the most familiar subjects of Christian art. He is usually represented as young and beautiful, bound to a tree and pierced by many arrows. There is another saint of the same name who is said to have suffered martyrdom in Armenia. Consult *Analecta Bollandiana*, vol. xxviii (Brussels, 1909).

SÉBASTIANI, sā'bȧs-tē-ä'nē, François Horace de La Porta (1772–1851). A marshal of France, born near Bastia, Corsica. He entered the army as a sublieutenant of infantry in 1792 and was one of Napoleon's most devoted partisans. He fought at Marengo (1800) and became brigadier general in 1803 and was wounded at Austerlitz (1805). In May, 1806, he was sent as diplomatic representative to Turkey, where he succeeded in alienating the Porte from Russia and England. He fought in Spain in 1807 and distinguished himself in the Russian campaign of 1812 and at Leipzig in 1813 and fought with extreme bravery in the campaign of 1814. On the exile of Napoleon to Elba he gave his adherence to the Bourbon government, but joined his old master on his return. He was Minister of Marine for a short time in 1830 and Minister of Foreign Affairs, with a slight interruption, from 1830 to 1834. He then went as Ambassador to Naples and (1835–40) to London. He was made a marshal of France in 1840.

SEBASTIANO DEL PIOMBO, sā-bȧs'tyä'nō dĕl pyŏm'bō (c.1485–1547). An Italian painter of the High Renaissance. His surname was Luciani, and he derived his name from his office of the papal seal (*piombo*). He was born in Venice, was a pupil of Bellini, and was strongly influenced by Giorgione in his early work. To his Venetian period belong a "Pietà," in possession of Lady Layard (Venice), and the altarpiece of San Giovanni Crisostomo at Venice. In 1509 he was invited to Rome by Agostino Chigi, for whom he painted in the Villa Farnesina eight lunettes in the garden lodge, and in the grand hall a "Polyphemus" as pendant to Raphael's "Galatea." Having gained but little success in this rivalry, he formed in 1512 his lifelong friendship with Michelangelo, endeavoring to unite Venetian coloring with the latter's drawing and thus to surpass Raphael. Michelangelo himself designed the "Pietà" in the Hermitage (St. Petersburg), and the remarkable "Pietà" in San Francesco at Viterbo, and parts of the "Resurrection of Lazarus" (1519, National Gallery, London), which is Sebastiano's principal historical production. Other works showing his influence are the "Martyrdom of St. Agatha" (1520, Pitti Palace); "Visitation" (1521, Louvre); a "Transfiguration" in fresco and a "Flagellation" in oil in San Pietro in Montorio (Rome).

Under Michelangelo's influence Sebastiano lost the Venetian breadth of handling; his paintings, becoming smooth in character and heavy in chiaroscuro, seem forced and theatrical. He devoted much time to adapting oil painting to fresco and endeavored in vain to induce Michelangelo to adopt his experiments in the Sistine Chapel. His paintings on slate, like the "Holy Family" at Naples, and on stone, like the "Ecce Homo" at Madrid and that at St. Petersburg, are very interesting. In 1531 he was appointed keeper of the papal seals, and from this time he practically ceased painting, residing at Rome until his death there, on June 21, 1547.

In portraiture Sebastiano's art was more independent, and he achieved high results, both as to characterization and perfection of technique. The influence of Raphael is often apparent, so much so that some of the most beautiful portraits formerly attributed to the latter are now recognized as Sebastiano's—as, e.g., the "Fornarina" (1512) in the Uffizi, the unknown young man in the gallery of Budapest, and the beautiful "Violin Player" in the Sciarra Palace, Rome. He painted the portraits of a series of popes, the best known of which is that of Clement VII in the Naples Museum. Other justly celebrated portraits are those of Doge Andrea Doria in the Doria Palace, Rome, and of Cardinal Pole in the Hermitage (St. Petersburg). The Metropolitan Museum, New York, possesses his portrait of Columbus.

Bibliography. Richter, in Dohme, *Kunst und Künstler Italiens* (Leipzig, 1878); Gaetano Milanesi, "Sebastiano del Piombo," in *Les correspondants de Michel Ange*, vol. i (Paris, 1890); Friedrich Propping, *Die künstlerische Laufbahn des Sebastiano del Piombo bis zum Tode Raffaels* (Leipzig, 1892); Giorgio Vasari, *Lives of the Most Eminent Painters, Sculptors, and Architects*, vol. iii (Eng. trans. by Blashfield and Hopkins, New York, 1896); Pietro D' Achiardi, *Sebastiano del Piombo* (Rome, 1908); Giorgio Bernardini, *Sebastiano del Piombo* (Bergamo, 1908).

SEBASTOPOL, sē-bȧs'tō-pŏl *or* sĕb'*as*-tō'pŏl, or **SEVASTOPOL,** sē-vȧs'tō-pŏl; *Russ. pron.* syĕ'vȧs-tą'pŏl-y'. The principal naval harbor in South Russia, in the Government of Taurida, on the south shore of a deep inlet of the Black Sea, in the southwestern part of the Crimea, about 48 miles southwest of Simferopol (Map: Russia, D 6). The inlet is about 4 miles long and ¾ of a mile wide and is one of the best roadsteads of Russia. The main inlet forms four bays, between two of which, on elevated ground, the city proper is situated. The entrance to the roadstead is strongly fortified, and there is a chain of forts south and north of the city. There are

extensive docks along the shore. The climate is very healthful and pleasant. The city has fully recovered from the effects of the Crimean War (q.v.), but, its commerce having been deflected almost entirely to Kaffa, the harbor is used mostly as a naval station. It has monuments to the heroes of the Crimean War and two museums. The principal industries are shipbuilding and wine making. Sebastopol, with the surrounding country, forms a separate administrative district. The population of the city proper was 67,752 in 1904 and 77,000 in 1913. The Greek colony of Chersonesus, situated near the present site of Sebastopol, was well known to the Russians under the name of Korsun at the period of the introduction of Christianity into Russia. In the sixteenth century the Tatar settlement of Akhtyar was established here. In 1784 the town of Sebastopol was founded by Catharine II, and in 1804 it became the chief naval station of Russia on the Black Sea. It was strongly fortified under Nicholas I. Sebastopol was bombarded by the Turks in the Great War which began in 1914. See CRIMEAN WAR; WAR IN EUROPE.

SEB'ASTOP'OLIS. See COLCHIS.

SEBEK, sĕb'ĕk. See SOBK.

SEBENICO, sā-bā'nē-kō (Slav. *Sibenik*). An episcopal city in the Crownland of Dalmatia, Austria, at the mouth of the Kerka in the Adriatic, 170 miles southeast of Triest (Map: Austria, E 5). It is built on a steep slope and was formerly defended by walls and towers. The Renaissance cathedral dates from 1430. The town has an excellent harbor, connected with the sea by a canal. There is considerable shipping trade. Pop., 1910, 10,100.

SÉBILLOT, sā'bē'yō', PAUL (1846–). A French writer on folklore, born at Matignon, Côtes-du-Nord, and educated at Rennes. He went as a young man to Paris to become a notary, but turned instead to painting. His sketches of out-of-the-way corners in Brittany introduced him to the subject to which he afterward devoted himself, that of folklore study. In 1885 he founded and edited the *Revue des Traditions Populaires*. His works on folklore include: *Contes populaires de la Haute Bretagne* (3 series, 1880–82); *Traditions et superstitions de la Haute Bretagne* (1882); *Gargantua dans les traditions populaires* (1883); *Contes des provinces de France* (1884); *Légendes, croyances et superstitions de la mer* (1886–87); *Le folklore des pêcheurs* (1901); *Le folk-lore de France* (4 vols., 1904–07); *Le folk-lore: littérature orale et ethnographie traditionnelle* (1913).

SEBINO, sā-bē'nō, LAKE. See ISEO.

SEB'ORRHŒ'A (Neo-Lat., from Lat. *sebum*, tallow + Gk. *ῥοία, rhoia*, flow, from *ῥεῖν, rhein*, to flow). A disease of the sebaceous glands, characterized by an increased and altered secretion of sebum and manifested by an oily or scaly appearance of the skin. The disease occurs mainly in two forms, a dry (seborrhœa sicca, dandruff, pityriasis) and an oily form (seborrhœa oleosa). Seborrhœa sicca occurs chiefly upon the hairy parts, such as the scalp, eyebrows, and beard, but it may invade nonhairy areas. It is a common cause of baldness. Seborrhœa oleosa is most often seen on the nonhairy parts, especially upon the face, forehead, and nose, which present a greasy, dirty, grimy appearance due to the excess of oily secretion and the adherence of particles of dust. The disease is believed to be of parasitic origin, and antiparasitic substances, such as sulphur, salicylic acid, and resorcin, are sovereign remedies. Seborrhœa is a disease chiefly of adolescence, but individuals with lowered vitality are often attacked. Hygienic measures, together with tonics, are indicated in such cases.

SE'CANT. See TANGENT; TRIGONOMETRY.

SECAU'CUS. A borough in Hudson Co., N. J., 1 mile from Jersey City, on the Delaware, Lackawanna, and Western Railroad (Map: New York City, Greater New York, C 5). The most prominent features include the borough hall, public library, and the county institutions. Farming and stock raising are the chief pursuits. Pop., 1900, 1626; 1910, 4740.

SECCHI, sĕk'kē, PIETRO ANGELO (1818–78). An Italian astronomer, born at Reggio. He joined the Jesuit Order in 1833 and after studying in Italy, England, and at Georgetown College in Washington, D. C., he served for a time as professor of mathematics and physics at the latter institution. He became director of the observatory of the Roman College in 1849 and was permitted to remain in that position after the expulsion of the Jesuits (1870–73). His discoveries in solar physics and spectroscopy were numerous and important, and he also made magnetic and meteorological observations. Among his works are: *Catalogo delle stelle* (1867); *Novi ricerchi sulle protuberanze solari* (1869); *Fisaca solare* (1869); *Researches on Electrical Rheometry* (Smithsonian Contributions, vol. viii, 1852); *Le soleil* (1870); *Le stelle, saggi di astronomia siderale* (The Stars, vol. xxxiv of the International Scientific Library, Leipzig, 1878). Consult Pohle, *Angelo Secchi* (Cologne, 1883).

SECCOMBE, sĕk'ŭm, THOMAS (1866–). An English author and editor, born at Terrington and educated at Balliol College, Oxford, where he took the Stanhope prize in 1887. From 1891 to 1901 he was assistant editor of the *Dictionary of National Biography*, to which also he contributed articles. He also became known as a lecturer and in 1912 was appointed professor of English at the Royal Military College, Sandhurst. Seccombe edited various English classics and wrote: *Twelve Bad Men* (1894); *The Age of Johnson* (1900); *The Age of Shakespeare* (1903), with J. W. Allen; *The Bookman History of English Literature* (1905–06); *George Meredith* (1913).

SECES'SION (Lat. *secessio*, separation, schism, from *secedere*, to go apart, from *se-*, apart + *cedere*, to yield, depart, go). In United States history, the term applied to the withdrawal of a State from the Union. The word "secession" seems to have been first used in the debates in the Philadelphia Convention on July 5, 1787, by Elbridge Gerry, who remarked that unless some compromise should be made "a secession would take place." The idea of secession appeared in New England about 15 years after the formation of the Union in connection with the acquisition of Louisiana. This addition of territory was strongly opposed by the New England Federalists through fear that ultimately it would result in the destruction of New England's predominance in the Union. Annexation of Louisiana was vigorously resisted as unconstitutional without the consent of all the States, inasmuch as the Constitution was alleged to have been made only for the original 13 States.

Jefferson's Embargo Act and the War of 1812 led to considerable disaffection in New England, which culminated in the Hartford Convention

(q.v.). The members of that body, however, afterward denied that the subject of secession was broached in any form, and its journal does not indicate any trace of such a discussion. But this is by no means conclusive, inasmuch as the journal contained no speeches or other matter to show what really was in the mind of the delegates. It would seem in all probability that some sort of disunion was intended, since it would have been impossible for the national government to comply with their demands. In 1832 the nullification movement in South Carolina, provoked by dissatisfaction with the newly established protective tariff, seemed to threaten the stability of the Union. After this the history of secession is inextricably bound up with the question of slavery. During the next 30 years isolated threats of secession were frequently made in the South whenever Northern hostility appeared to imperil the interests of slavery. Nor did the idea entirely die out in New England, where at the time of the agitation over the annexation of Texas a number of antislavery Whig members of Congress, headed by John Quincy Adams, issued an address to their constituents declaring that annexation would fully justify a dissolution of the Union.

The question which brought the secession movement to a head related to the exclusion of slavery from the Territories. (See TERRITORIES.) In 1847, when the question began to assume an acute stage, Calhoun undertook to secure the cooperation of the slave States in a movement looking towards secession, but the plan failed. The enactment of the so-called Compromise Measures of 1850 (q.v.) again raised the question, but in one or two Southern States, where it was made an issue, the secessionists were defeated. Disunion had, however, taken a strong hold in the South. Then came the passage in some of the Northern States of so-called personal-liberty laws in contravention of the Fugitive Slave Law, the John Brown raid, and the election of President Lincoln, all of which intensified the feeling in the South in favor of withdrawal from the Union. In the South the right of secession was regarded as one of the reserved powers of the States, there being no prohibition in this respect in the Constitution nor any power conferred upon the Federal government to compel a State to remain in the Union against its wishes. It is worthy of note that as late as 1860 many persons of prominence in the North, among them Horace Greeley, acknowledged the right of secession, only insisting that the step should be taken "with the deliberation and gravity befitting so momentous an issue." The regular machinery by which the work of secession was accomplished was a State convention called by the Legislature or self-assembled, as in Texas. Consult: J. F. Rhodes, *History of the United States from the Compromise of 1850*, vols. ii, iii (New York, 1900–06); D. W. Howe, *Political History of Secession to the Beginning of the American Civil War* (ib., 1914); McLaughlin and Hart (eds.), *Cyclopedia of American Government*, vol. iii (ib., 1914). See CIVIL WAR IN AMERICA; CONFEDERATE STATES OF AMERICA; NULLIFICATION; UNITED STATES; and authorities cited under those titles.

SECESSION. In modern German art, more especially in painting, that tendency which in subject, form, and coloring deviated from traditional conceptions to such an extent as to result in the secession of the younger generation of artists from the older art unions and in the arrangement of separate exhibitions. The movement began in 1892 in Munich, where Fritz von Uhde, Dill, A. Keller, and Franz Stuck took the lead; at Berlin in 1899 under Lieberman, Leistikow, Slevogt, and others, and in 1899 at Vienna; but here the participants separated later into two groups in 1905. The Secessionists are affiliated with other radical groups, like the Scholle in Munich and the Elbier in Dresden, with whom they formed a Deutscher Künstlerbund in 1904.

SECESSION, WAR OF. See CIVIL WAR IN AMERICA.

SÉCHÉ, sā-shā′, LÉON (1848–1915). A French literary critic, born at Ancenis. He first attained public attention in Paris by the publication of a fragment of a poem on the drama of Querétaro, *"Dies iræ" du Mexique* (1869). This was soon followed by two collections of verse entitled *Les griffes du lion* (1871) and *Amour et patrie* (1875). He had previously founded a literary review, *Juvénal*, which was fined by the censor during the last years of the Empire. He then established the *Revue Illustrée de Bretagne et d'Anjou*, and later on two reviews devoted to literary criticism, *Les Annales Romantiques* and *La Revue de la Renaissance*, both of which are still published. Among his numerous works the following are probably the best known: *Question sociale* (1887); *Les derniers Jansénistes* (3 vols., 1890–91); *Les origines du Concordat* (2 vols., 1894); studies on Alfred de Vigny (1902) and Sainte-Beuve (1904); *Lamartine de 1816 à 1830* (3d ed., 1906); *Alfred de Musset* (1906); *Les muses romantiques: Delphine Gay et Mme. d'Arbouville* (2 vols., 1910); *La jeunesse dorée* (1910); *Les amitiés de Lamartine* (1911); *Victor Hugo et les poètes de Cromwell à Hernani* (1912); *Etudes d'histoire romantique* (2 vols., 1910–13).

SÉCHELLES, MARIE JEAN HÉRAULT DE. See HÉRAULT DE SÉCHELLES, M. J.

SECHER, sĕk′ĕr, VILHELM ADOLF (1851–). A Danish law historian, born at Bröndum. He studied the history of law under K. Maurer in Munich in 1878–79 and gained the degree of Dr. Jur. at Copenhagen in 1885. After long connection with the archives he was appointed Royal State Archivist in 1903. He wrote *Om Vitterlighed og Vidnebevis i den ældre danske Proces* (1885) and edited good editions of various old sources of law, such as *Christian V.s danske Lov* (1891); *Kongens Rettertingsdomme 1595–1614* (2 vols., 1881–86); *Corpus Constitutionum Daniæ: Forordninger, Recesser, etc., 1558–1660* (1887 et seq.; 5 vols. ready in 1915); *Forarbejderne til Christian V.s danske Lov* (2 vols., 1891–94), with Christian Stöckel.

SECHTER, zĕk′tĕr, SIMON (1788–1867). An Austrian music teacher and contrapuntist, born at Friedberg, Bohemia. In 1851 he became court organist and professor of harmony and composition at the Vienna Conservatory. He wrote much Church music, numerous fugues, pianoforte pieces, preludes, the burlesque opera *Ali Hitsch-Hatsch* (1844), a *Generalbass-Schule*, and songs. His greatest work is *Die Grundsätze der musikalischen Komposition* (1853–54), a most valuable musical treatise.

SECKENDORF, zĕk′en-dôrf, GUSTAV ANTON, BARON (1775–1823). A German lecturer and writer, born at Meuselwitz. After studying at Leipzig, Freiburg, and Wittenberg, he traveled in the United States (1796–98). He devoted

himself largely to recitations and lectures on æsthetics, delivered under the pseudonym of Patrick Peale. In 1814 he was appointed professor at the Carolinum in Brunswick, but in 1821 he went again to America and died in poverty at Alexandria, La. Among other works, he published *Vorlesungen über Deklamation und Mimik* (2 vols., 1816).

SECKENDORFF, zĕk'*e*n-dôrf, FRIEDRICH HEINRICH, COUNT VON (1673–1763). A German field marshal and diplomat. He was born at Königsberg, Franconia, and was brought up by his kinsman, Veit Ludwig von Seckendorff (q.v.). He served successively, from 1693, in the English-Dutch and Imperial armies, rose to the rank of colonel, and fought with conspicuous bravery during the War of the Spanish Succession. From 1709 in the service of Augustus II of Poland and Saxony, he operated in Flanders (1710–11) and attended the peace negotiations at The Hague. Made lieutenant general after suppressing an uprising of the Poles in 1713, he took part in the siege of Stralsund by the Prussians (1715). Appointed lieutenant field marshal by Emperor Charles VI, in 1717 he fought at Belgrade and in 1718 in Sicily and was raised to the dignity of Count of the Empire. In 1721 he became Governor of Leipzig, but also remained in the Imperial service, was made Feldzeugmeister in 1723, and sent as Ambassador to Berlin in 1726, where he succeeded in 1728 in concluding a secret treaty between Prussia and Austria against Hanover and England. Obtaining leave to join the army on the Rhine, in 1734 he again rendered important services, and, although greatly hampered by the inactivity of Prince Leopold of Anhalt-Dessau, signally defeated the French at Klausen, Oct. 20, 1735. He was sent to Hungary in 1737 as field marshal to command the Imperial forces against the Turks. Victorious at first, he was blamed for the unsuccessful progress of the campaign, was recalled to Vienna, tried, and was kept in durance at Graz until November, 1740, when the investigation was suspended. In 1741 he resigned his offices and, transferring his allegiance to Bavaria, rendered valuable services to Emperor Charles VII during the War of the Austrian Succession. On the election of Emperor Francis I Seckendorff obtained from Maria Theresa his reinstatement into all his former offices, but in 1746 he retired to his estate near Altenburg, Saxony. In December, 1758, Frederick II, accusing him of intriguing with Austria against Prussia, had him captured and kept him in custody at Magdeburg until May, 1759, when he was allowed to return to his estate.

SECKENDORFF, VEIT LUDWIG VON (1626–92). A German statesman and historian, born at Herzogenaurach. Upon leaving the University of Strassburg he entered the service of his patron, Ernst the Pious, Duke of Gotha, rose to the post of Privy Councilor and Chancellor, and brought about important reforms in the ducal territories. In 1664 he became Chancellor to Duke Moritz of Saxony-Zeitz, after whose death, in 1681, Seckendorff retired to his estate at Meuselwitz. Called to Berlin in 1691 by the Elector Frederick III of Brandenburg to adjust certain sectarian difficulties, he was made chancellor of the newly established university at Halle. A distinguished student of political science and the foremost Protestant Church historian of his time, he published *Der deutsche Fürstenstaat* (1655), for a long time the standard work of its kind at the German universities; *Der Christenstaat* (1685); and, most important of all, the *Commentarius Historicus et Apologeticus de Lutheranismo* (1688), a documentary refutation of Maimbourg's *Histoire du Luthéranisme.*

SECOND. For musical usage, see INTERVAL; for mathematical, see CIRCLE.

SECOND ADVENT OF CHRIST. The return of Jesus Christ in visible form to earth. On the basis of certain sayings of Jesus the early Church expected that within a comparatively short period after his ascension he would again come and usher in the full glory of the Messianic age. The passages in the Gospels containing these sayings are: (1) Mark vi. 1–11 = Matt. ix. 35–x. 16 = Luke ix. 1–5; (2) Mark ix. 1 = Matt. xvi. 28 = Luke ix. 27; (3) Mark xiii = Matt. xxiv = Luke xxi; (4) Mark xiv. 62 = Luke xxii. 69 = Matt. xxvi. 64; (5) Luke xvii. 20–xviii. 18. A critical examination of these passages reveals the fact that sayings of Jesus which in one Gospel are of a broad, general character are reported in another Gospel in a much more precise and specific form, e.g., Mark ix. 1, "Who shall not taste of death until they see the *kingdom of God* come," becomes in Matt. xvi. 28, "Who shall not taste of death until they see the *Son of Man* coming in his *kingdom.*" This tendency manifested itself almost immediately after his departure, though he had warned against speculation on such points (cf. Acts i. 6–7). It appears in the first formulation of Christian doctrine by Peter in the Pentecost sermon in the use of Old Testament expressions (Acts ii. 20, 35) and more plainly in the words reported in Acts iii. 20–21. The reason for this lay in the conception of the Messianic kingdom as an earthly rule, which the early Jewish Christians could not lay aside, and to some extent in the literal meaning given to the highly figurative language of the Old Testament employed by Jesus in his eschatological discourses. As the years passed, the more enlightened leaders of the Church came to feel that the true meaning of Jesus' words and realization of his promises were to be found in the eternal, spiritual, heavenly life (cf. 1 Peter with the sermon of Peter in Acts; cf. Paul in 1 Cor. xv; also the Gospel of John) rather than in a material, earthly kingdom. But the doctrine of the Parousia, or second coming of Jesus in a comparatively short time, was by no means given up. It continued to wield great influence on Christian thought and retained its place in the general eschatological conceptions, as the great event which was to usher in the Messianic age. The practical consequences of such conceptions were sometimes serious and necessitated wise and cautious treatment (cf. 2 Thess.; 2 Peter iii. 1–13).

In later times the doctrine has been held in two forms: the Second Advent of Christ will be either (1) premillennial, i.e., before the age of the great prosperity and triumph of the Church; or (2) postmillennial, after this age and immediately before the general judgment. The former view is advocated upon the ground of certain interpretations of Rev. xx. 4–7, supported by other passages of Scripture, and more particularly by the general conception, thought to be derived from the Scriptures, that the present dispensation does not contain in it, under the plan of God, the means necessary to bring the world to Christ. Hence it will be necessary that Christ, the King, shall himself come to rule.

This view is held by an active school of evangelists, by many individual Christians in all communions, and by many who have united into separate denominations, such as the Seventh Day Adventists. The other view regards the exegesis of the premillennialists as unsound, and their views of the present condition and tendencies of things as pessimistic, and bases its conception of the gradual spread and final triumph of the gospel upon the definite promises of the word and the analogies of God's methods everywhere else in Providence. In recent times the questions at issue have been: Did Christ himself expect a personal second coming? Is Mark xiii (= Matt. xxiv = Luke xxi) interpolated with Jewish apocalyptic sections? Does Christian belief demand a personal second coming? See ADVENTISTS; ESCHATOLOGY; JUDGMENT, FINAL; MESSIAH; MILLENNIUM.

SECONDARY QUALITIES. All the attributes of an object of perception which were supposed to be due to any peculiarity of the sense constitution of the percipient; over against secondary qualities were placed primary qualities (q.v.), which were supposed to be apprehended by the percipient as they are in themselves. Thus, color was called a secondary quality, while extension was called primary, because it was supposed that the human eye gave the characteristic of color to the object, while the spatial character of the object was regarded as original. This distinction has played a great part in the philosophy of the last three centuries. See KNOWLEDGE, THEORY OF; PRIMARY QUALITIES.

SECONDARY SCHOOLS. A term applied to high schools, academies, and other schools which prepare pupils for college courses or give instruction of the same general grade as that required for college preparation. In the latter part of the nineteenth century American secondary schools, especially the free high schools, became less distinctively schools for college preparation and more and more finishing schools, i.e., schools giving a general preparation for business life or for professional education without consideration of college training. In this connection manual training, modern languages, and elementary science were introduced, and the old classical disciplines cut short or rendered optional. The broadening of college courses, however, and especially the spread of the elective and accrediting systems, rendered the transition from secondary schools to colleges easy even under the new conditions; accordingly these schools are still the chief institutions for college preparation, as they are the chief sources for training supplementary to that given in elementary schools. See ACADEMY; HIGH SCHOOLS; PUBLIC SCHOOLS. For the corresponding schools in England, France, and Germany, see under NATIONAL EDUCATION.

SECONDAT, CHARLES DE. See MONTESQUIEU, BARON DE.

SECOND SIGHT. A supposed faculty of "internal" sight whereby persons see distant occurrences or foresee future events; so called because, for the time, it takes the place of normal sight. Recently this power has been claimed by those who profess clairvoyance (q.v.). Historically second sight is of interest because of the deeply rooted belief in its reality prevalent in northern Europe among the Celtic population generally, and especially in the Hebrides and Scottish Highlands. Some of the Scottish seers asserted their power to impart the gift by teaching; others declared it to be hereditary. It was often believed that children, horses, and cows, as well as men, were affected with the visions. The most commonplace and trifling matters were revealed and predicted, coming events being foretold by the appearance of characteristic omens. Modern psychical research permits some of its devotees a similar belief. Consult: Martin, "Western Islands of Scotland," and Pennant, "A Tour in Scotland," in Pinkerton, *Voyages and Travels* (London, 1809); Crowe, *The Night Side of Nature* (2d ed., ib., 1854); James Boswell, *Life of Johnson* (ed. by Birkbeck Hill, 6 vols., Oxford, 1887); T. F. Thiselton-Dyer, *The Ghost World* (Philadelphia, 1893); Andrew Lang, *Cock Lane and Common Sense* (London, 1894); E. B. Tylor, *Primitive Culture* (4th ed., ib., 1903).

SECRET (OF., Fr. *secret*, from Lat. *secretus*, secret, separated, p.p. of *secernere*, to separate, from *se-*, apart + *cernere*, to separate). One of the prayers of the mass of the same general form as the collect, but recited by the priest in so low a voice as not to be heard by the people, whence the name *secreta* is derived. It follows immediately after the oblation of the eucharistic bread and wine, and was in the earlier ages the only prayer of oblation provided in the missal; the Sacramentary of St. Gregory calls it the *Oratio super oblata.*

SECRÉTAN, *se-krā'tän'*, CHARLES (1819–95). A Swiss metaphysician, born at Lausanne. He was a pupil of Vinet at Bâle in 1835 and of Schelling at Munich in 1837. In the latter year he founded the *Revue Suisse* and in 1838 was appointed professor of philosophy at the University of Lausanne. The work of Secrétan, at once a philosopher and a theologian, was one of the most interesting attempts that have been made to reconcile the dogmas of Christianity with the principles of philosophy. The system of Secrétan, evolved from that of Descartes, is best set forth in his principal book, *La philosophie de la liberté* (2 vols., 1848–49; 3d ed., 1879). Other works are *La philosophie de Leibnitz* (1840); *La raison et le bonheur* (1863); *La civilisation et la croyance* (1887; 3d ed., 1893); *Les droits de l'humanité* (1890).

SECRETARY. In the Federal government of the United States, the head of an executive department and a member of the President's cabinet. See the articles on the various departments, as STATE, DEPARTMENT OF; ETC.

SECRETARY BIRD, or SERPENT EAGLE. A remarkable raptorial bird (*Serpentarius secretarius*) of South Africa, the sole representative of a separate family (Serpentariidæ), classified between the turkey buzzards and the true vultures. It is about 4 feet long and has very long, unfeathered legs; the plumage is bluish gray, and there is an erectile crest of single feathers, suggesting quill pens carried above the ears. It feeds on reptiles of all kinds, which it devours in great numbers, and is so highly valued, on account of the constant war which it wages against serpents, that a fine is inflicted in Cape Colony for shooting it. It fearlessly attacks the most venomous serpents, stunning them with blows of its knobbed wings or feet or seizing and carrying them into the air so high that they are killed when let fall. Small serpents are swallowed entire; the larger ones are torn to pieces. The secretary is most frequently seen in pairs or solitary. It is tamed as a protector of poultry yards, but if not sufficiently fed is apt to help itself to a chicken or duckling. It con-

structs a huge nest in trees and occupies it year after year. Consult Alfred Newton, in *Dictionary of Birds* (London, 1893–96), and A. H. Evans, "Birds," in *Cambridge Natural History*, vol. ix (New York, 1900).

SECRETARY OF STATE. An ancient office of importance in the government of the United Kingdom. The first authentic record of its existence is in the reign of Henry III, when John Maunsell is described as "secretarius noster." Two secretaries were first appointed towards the close of the reign of Henry VIII. At the union of 1707 Anne added a third Secretary of State for Scotland, but this office was soon abolished. In the reign of George III there were at first two secretaries, and for a time, until 1782, a third for America. The two secretaries directed home affairs: to one the foreign affairs of the northern department were committed; to the other those of the southern department. Irish affairs belonged to the province of the elder secretary. There are now in the United Kingdom five principal secretaries of state, who are respectively appointed for home affairs, foreign affairs, war, the colonies, and India. They are always members of the Privy Council and of the cabinet. For the American Secretary of State, see STATE, DEPARTMENT OF.

SECRET ASSOCIATIONS. Societies which admit members by an initiation and subscription to an oath and often possess an elaborate ritual leading to higher degrees, with the use of symbols, passwords, and grips as a means of recognition among members.

Many secret societies are found on the west coast of Africa. Among the Polynesians societies which unite large numbers of freemen in a freemasonry of common interest virtually control the economic and the political life. (See DUK-DUK.) The associations of priests that conducted the mysteries of the ancient religions are counted as the forerunners of later societies. The secrecy was due to one or both of two causes: (1) the tendency to hide all knowledge of life in mystical forms, away from the contamination of the vulgar, and to keep the multitude under the sway of superstition; or (2) the danger of maintaining such advanced ideas in the face of ignorance and prejudice. The political element entered at a very early date. The Pythagoreans combined philosophy and politics. The East was a fertile territory for secret societies. The Ismaili and afterward the Assassins (q.v.) were organized in behalf of the claims of Ali's successor to the throne of the caliphate. It is customary among many Protestants to consider the Jesuits as a secret society in spite of their relation to the Church, but the notion is based upon a misapprehension. Secrecy and strange ceremonials often accompanied gatherings of the Middle Ages that first speculated on religion and science. The Secret Tribunals of Westphalia (the Vehmgerichte) and the Beati Paoli of Sicily were constituted to administer justice in an age of anarchy. On the other hand there were certain criminal associations of brigands who levied tribute upon the people, the best known of which is the Mafia (q.v.). With the awakening of modern thought secret societies were formed with speculative tendencies. The Rosicrucians (q.v.) mingled mysticism and occultism. The Illuminati (q.v.) sought social amelioration and were a source of republican propagandism. In the nineteenth century secret political societies have taken part in nearly every revolution. (See CARBONARI; FENIAN SOCIETY; HETÆRIA PHILIKE; NIHILISM.) China is honeycombed with secret societies, many of which have existed from the most ancient times. (For the rôle played by the Boxers in the uprising of 1900, see CHINA.) Many societies are ostensibly philanthropic, and some are purely benevolent, providing for marriage, burial, and business loans. In the United States there are many secret societies, in which, however, the fraternal element largely predominates. The secret societies of Servia, formed with a nationalist purpose, played a significant rôle in creating the conditions out of which the European War arose. See SOCIETIES; SECRET SOCIETIES.

Consult: C. W. Heckthorn, *Secret Societies of All Ages and Countries* (new ed., 2 vols., London, 1897), containing a bibliography; R. M. Johnston, *The Napoleonic Empire in Southern Italy and the Rise of Secret Societies* (New York, 1904); A. C. Stevens (ed.), *Cyclopædia of Fraternities* (2d ed., ib., 1907); Hutton Webster, *Primitive Secret Societies* (ib., 1908).

SECRE'TION (Lat. *secretio*, separation, from *secretus*, secret, separate). A physiological process by which certain materials are separated from the blood to form new substances called secretions, through the agency of certain highly specialized cells. These materials are of two kinds: *true secretions*, which have some definite function to perform in the animal economy, and *excretions*, which are discharged from the body as useless or injurious. To these must be added the so-called internal secretions, substances elaborated in ductless glands and discharged directly into the blood, as, e.g., the thyroid secretion. (See SECRETIONS, INTERNAL.) Secretions are further distinguished by the fact that they do not exist already formed in the blood, but require for their production special cells and a process of elaboration; while excretions are merely abstracted from the blood in the same form in which they already occur in that fluid. Both secretion and excretion contribute to health and nutrition, the one by performing some positive function, as aiding digestion, the other negatively by freeing the body of the products of destructive metabolism, which if retained would cause disease.

Secretion is performed by the following organs: the serous and synovial membranes; the mucous membranes, with their special glands, buccal, gastric, and intestinal; the salivary glands and pancreas; the mammary glands; the liver; the lachrymal glands; the kidneys and skin; the testes. Secretion takes place by two different processes, the one physical and the other chemical. The physical processes are those of filtration and dialysis; the chemical process is one of true secretion. Both processes are employed in the secretion of the urine; the former within the Malpighian bodies and the latter in the *tubuli uriniferi*. (See KIDNEY.) The simplest form of secretion is that of the serous and synovial membranes, the pleuræ, the pericardium, peritoneum, and the lining of the joints. These are lubricated by a fluid transuded directly through the flat endothelial cells lining these membranes from the blood vessels beneath them. A somewhat more elaborate process is that of the mucous membranes lining the respiratory and gastrointestinal tracts. Thousands of cylindrical recesses, known as tubules, paved with secreting cells, empty their peculiar secretions upon every square inch of these surfaces.

An isolated group of such tubules emptying by a single duct is called a simple gland; several of such groups having a common single duct constitute a compound gland; and the larger glands are simply multiplications of these groups and serve to increase the amount of secreting surface within a given space. For a description of the manner in which cells are arranged in the various glandular structures, see GLAND; KIDNEY; LIVER; MUCOUS MEMBRANE AND MUCUS; ETC. The characters of the various secretions, among which may be mentioned saliva, gastric juice, pancreatic juice, bile, ordinary mucus, sweat, tears, urine, the products of the serous and synovial membranes and the sebaceous glands, are described under their own names or those of the organs which produce them.

SECRETION. The process in plants by which a substance is formed and expelled from a cell, or the substance which is so formed. The term is usually restricted to the formation of the many and diverse special materials, such as enzymes, resins, volatile oils, and sugars, which are of service to the plant. Secretions are either poured out upon the surface or into internal receptacles. See GLAND.

The formation of the secretion may be either direct or through the production of an intermediate substance. The details of the elaboration, however, are still obscure. For example, sugar is supposed to be formed directly, whereas enzymes are usually preceded by the production of minute granules of zymogen in the protoplasm. This distinction may mean only that in some cases visible products precede the final one, while in others they do not. No satisfactory explanation of the process has been found. Such glands may secrete once only, or repeatedly, or continuously. In the second method the secretion results from the disorganization of the protoplasm which it eventually replaces. In multicellular glands the cell walls disappear and after one secretion the glands perish. If the secretion be soluble in water, e.g., sugar, as in many nectaries, and by exposure to the air the solution becomes concentrated, its osmotic pressure (see OSMOSIS) may be so increased that it withdraws water from the cell. Nectar is thus kept fluid and ready for the insects which it attracts.

SECRETIONS, INTERNAL. Substances secreted by animal organs or tissues which preside over the development, growth, reproduction, and the chemical regulation of the body. They are also called hormones (q.v.) and are defined by Kirkes as substances "produced by one tissue or organ to which some other portion of the body has become biologically adapted to such an extent that its normal function can proceed only under the influence of the substance."

The more important organs which, according to modern views, produce internal secretions are the thyroid, parathyroid, pituitary, thymus, suprarenals, and chromaffin tissues, the pancreas, the duodenal and pyloric mucosa, the liver, kidney, testis, ovary, corpus luteum, placenta, and fœtus. These substances are definite, but complex, chemical bodies and differ from the enzymes in being thermostable. By these enzymes we mean the external secretions, such as diastase, pepsin, typsin, etc., elaborated by the digestive organs. The function of the internal secretions seems to be to provoke the manufacture of enzymes and promote their action and generally to act as excitants to physiologic activity. The hormones which have either been proved or assumed to exist are the pancreatic secretin, formed in the epithelium of the duodenal mucous membrane, which stimulates the flow of pancreatic juice; a hormone formed in the pancreas which influences the absorptive activity of the intestinal epithelium; the gastric secretin formed in the pyloric mucosa, which stimulates the secretion of gastric juice; vasodilator hormones formed in functionally active tissue which have a specific effect upon the vessels of the functioning organ; a vasoconstricting and diuretic hormone secreted in the posterior lobe of the pituitary body; another vasoconstricting hormone in the kidneys; a hormone produced in the anterior lobe of the pituitary body, determining the growth of bone and connective tissue; a hormone controlling the oxidation of sugar and manufactured in the islands of Langerhans in the pancreas; a thymus hormone which influences the development of the reproductive organs; a hormone produced by the salivary glands which controls the flow of water from the blood capillaries in these glands; a fœtal hormone which stimulates the growth of the mammary glands; ovarian and testicular hormones, which have to do with the processes of reproduction.

The action of these internal secretions is complex and is as yet imperfectly understood. Many facts, however, have been collated from experimental observations which throw considerable light upon this obscure subject. A few of these observations may be given in illustration of the manner in which hormone balance is preserved. The suprarenal glands have been shown to be stimulated by, and to work in harmony with, the thyroid and pituitary; they antagonize the pancreas, especially in the control of sugar combustion; they inhibit the thymus and secretin and stimulate the testis and ovary. The thyroid stimulates and is stimulated by the reproductive glands, coöperates with the hypophysis, stimulates the adrenals, and inhibits the pancreas. Thyroid secretion in excess stimulates the intestines. The posterior lobe of the hypophysis stimulates the smooth muscle of the uterus and intestines, coöperates with the thyroid, stimulates the mammæ, and is antagonized by the ovary and the pineal body. There is said to be an antagonistic action between it and the pancreas. The pancreas controls and is in turn controlled by the adrenals and is assisted by the parathyroids; it is stimulated by the secretion formed in the duodenal mucosa and is apparently inhibited by the thyroid and the hypophysis. The spleen is believed to have a stimulating influence upon the stomach and digestion generally and to furnish a stimulant to the muscles of the intestines. When to these actions and cross actions are added those of the reproductive glands, the pineal body, the thymus, parathyroids, mammæ, and liver, it will be appreciated that the subject of internal secretions is one of no little intricacy. A deficiency or excess of one or several of these secretions, it will be seen, may upset the whole chemical balance of metabolism. Indeed, without certain of these secretions the body cannot live.

USES OF IN MEDICINE. The subject of endocrinology shows progressive development along various lines and has to some extent become a specialty of medical practice, with its periodicals and societies. Side by side with this advance there is also apparent a spirit of scepticism. It is admitted by all that some of the substances

which preëxist in the glands of internal secretion have marked dynamic properties, notably epinephrin (which may also be prepared by synthesis), which is in common daily use in medical and surgical practice as a hemostatic and cardiac stimulant. But true internal secretions are not regarded as physiologically active substances, save incidentally. In the main they are looked on as substitutive in character, as food principles intended to make up for a shortage in the economy. Thus if an individual is suffering from a lack in his organism of suprarenal gland substance epinephrins may act as a reconstituent. Cases of this sort are not very common in routine practice but any individual can benefit by the action of epinephrin in hemorrhages or cardiac weakness, and it by no means follows that there is a shortage of this substance in his tissues. In like manner thyroid extract may, if there is a true deficiency of thyroid substance in the body, appear to work miracles, even to the extent of curing dwarfism and imbecility: but the same drug will often appear to benefit various symptoms even when there is no evidence of shortage of natural supply. For such reasons many are in favor of judging remedies of this class on their general merits. It is argued that with few exceptions the internal secretions are not dependable in medicine and that mostly they are quite inert. In the case of extract of hypophysis this usually disappoints even when there is a deficit of this substance in the body; while its remarkable action in stimulating the contractions of the uterus in labor has no parallel in physiology, for in these cases of uterine insufficiency there is no claim that the organism is deficient in hypophysis substance. Isolated shortage of gland substance is apparently the exception in practice and it is more common to find evidences of the implication of several of these organs. In most cases, therefore, the practitioner prefers to combine or alternate several of these substances comprising those which have known physiological action — epinephrin, thyroid substance and hypophysis substance. Naturally, as is the case with any active drug, there must be instances in which these medicaments could aggravate the symptoms already present: and the practitioner is also concerned over when not to give them. In addition they are injurious in overdoses. Of these three drugs thyroid substance is par excellence substitutive in action. In most of the cases in which it is of proved efficacy there is a demonstrable shortage of thyroid substance in the economy; while there are also many cases in which its use would be contraindicated. As soon as its substitutive action is attained further administration may become harmful. In many cases of incurable deficiency of thyroid substance it is given in the proper dosage for years. If this use of the thyroid principle had never been discovered the subject of endocrinology would hardly have been developed. Not only in isolated cases of thyroid deficiency but in all cases of multiple shortcoming in glands of internal secretion, thyroid substance is used unless actively contraindicated or poorly borne.

In contrast with the preceding the chief use of epinephrin is as already mentioned. In Addison's disease, a chronic incurable condition due to deficiency of suprarenal substance, the drug is of little or no benefit. The chief use of hypophysis substance has also been mentioned as quite unconnected with the function of the hypophysis itself. In destruction of this organ only a fraction of cases present positive results from use of the gland substance. In the balance the report is negative with occasional slight or transient benefit.

Next in order to the three substances already discussed should be mentioned the gonads in both sexes. These contain no powerful preexisting active principles and when given by the mouth or injection of extracts in deficiency of gonadic substance the result is more or less open to doubt. There is never any overaction nor is there any possibility of overdosage. Nevertheless in both animal and human material grafting the gonads is often followed by the most striking restoration of lost function. Thyroid grafting is also similarly successful but by reason of the good results obtainable by ordinary feeding it has never been necessary to graft tissue or inject extracts to obtain the desired result. Only in certain cases in which feeding is unsatisfactory has it been found advisable to perform grafting.

It is true that ovarian substance is used in large amounts in cases of surgical removal of these organs and at the climacteric, and the results often seem striking, but there are numerous sources of fallacy. The possibility of coincidence is present, for the climacteric, whether artificial or natural, varies greatly in length and symptoms. Ovarian substance is also used in a variety of menstrual disturbances, and in uterine disease presumably of ovarian origin. Results while occasionally striking are extremely uncertain and it is often impossible to understand how recovery can thus be brought about. Since this may also be affirmed of the thyroid and hypophysis and even of many similar extracts chiefly regarded as inert, the conviction is near at hand that in a minority of cases substitutive results are possible, although it is more by luck than by skill that they are attained. That the results of ovarian feeding are legitimately attained seems to be shown by the absence of corresponding results in feeding with testicular extract. Few report anything convincing in this field although even an inert remedy usually has a short period of favor due to coincidence, suggestion, and other extrinsic factors.

The failure of testicular therapy is one of the paradoxes of medical treatment of disease when we contrast it with the results of testicular grafting. The subject has been before the profession since the pioneer work of Brown-Sequard in 1888. That scientist knew nothing of the internal secretion of the organ and was interested only in external secretion, and the brilliant results alleged by him to follow injections have no part in the subject of endocrinology.

During the past decade it was discovered by Steinach that ligation of the excretory duct of the male gonad (vas deferens) greatly stimulates the activity of the interstitial portion of the organ so that it has all the force of a grafting procedure. This little operation is now (1922) being exploited in Europe and the United States, the results varying from remarkably good to negative. Between the two we find limited and transient benefit. It is admitted by all that the positive result is not in any sense permanent and that the general reaction may vary much in duration and character. No one claims that true rejuvenation occurs but the patient may in select cases recover the

amount of "youth" which he has forfeited through disease; in a word a prematurely old man has at times apparently been changed to a normally old man. Animal experiments together with a few results in the human female render it probable that the corresponding operation in that sex is able to cause reappearance of the internal secretion of the ovary in the aging woman. The operation is however considerably more serious than in the male.

In an article by Dr. Sajous, the leading pioneer in the medicinal use of internal secretions (New York *Medical Journal*, May 18, 1921) the author singles out some of the chief uses of suprarenal and thyroid preparations as based on their actual function in the economy. He claims that the basic activity of adrenaline in the body is one of oxygenation — that is, it normally increases and maintains the oxygen intake of the body along with the elimination of carbon dioxide. To discharge this function in health from 30 to 100 ccm of adrenaline must be poured into the circulation every 24 hours. In Asiatic cholera the disease picture is largely one of acute adrenaline shortage and in this affection the drug is said to be a specific which must be given in large and repeated doses. The condition of exhaustion which supervenes in the various infectious diseases, notably (in addition to cholera already mentioned) typhoid fever, pneumonia, and influenza, are evidently due to a persistent exhaustion of the suprarenal glands. The author does not refer to the debility which is a sequel to influenza, etc., but to the condition of adynamia which develops in the course of the disease and brings about the fatal ending. In all such cases the drug should be given by intramuscular injection as a matter of routine. Many lives might thus be saved. The virtue of the remedy in these cases is not merely in its stimulant action upon the heart but in the deeper function of promoting oxygenation and nutrition.

In the diseases of old age, as pneumonia, the exhaustion which so often leads to a fatal ending is of the same nature and is combated in the same manner. Naturally adrenaline should never be administered unless there is positive evidence of its shortage in the body as shown by the usual tests: thus it is an error to give it in heart failure which follows chloroform anaesthesia unless there is clinical evidence of exhaustion of the adrenals. Dr. Sajous and others claim that the group of stimulant remedies in common use as caffein, strychnia, and even cocaine, nicotine, and alcohol, exert a stimulating action on the adrenals. Hence there is no gain in giving adrenaline in cases which respond to caffein and strychnine. Among the numerous physiological properties attributed to adrenaline is the destruction or removal of fatigue and waste products.

Kendall, working at the Mayo Foundation, (1919) created a new epoch in biochemistry by isolating from the thyroid a substance termed thyroxin which is far more powerful and more representative of the gland than any other previously in use. It is an exact chemical substance and not a mixture which forms salts with acids, while many dibasic compounds containing thyroxin have been prepared. The empirical formula is C11 H10 O3 N13 and the actual percentage of iodine is in the vicinity of 65.

Writing of thyroxin in 1917 its discoverer states that "the changes occurring in a patient with thyroid deficiency or in an experimental animal from the administration of thyroid are so great that practically every cell within the animal body is changed. The effects are felt throughout the nervous system and the circulatory system, the rate of metabolism is enormously increased and even the skin and hair show revolutionary changes." Unlike adrenaline thyroxin stimulates denutrition as well as assimilation — katabolism as well as anabolism, whence its well known "antifat" properties. Another distinction lies in the restriction of adrenaline to acute conditions which have rapidly supervened while thyroid preparations are found of most use in chronic deepseated conditions and usually is given over long periods of time; although there are exceptions, as when this drug is given in connection with surgical operations on the thyroid.

The promiscuous use of thyroid extracts in chronic affections does not imply a belief in the universality of thyroid shortage in the body, but is rather due to the fact the preparations so given are stimulants of denutrition and hence alternatives of a high order. In place of giving thyroid preparations as a single disease remedy, as for example in chronic rheumatism, it is much better to combine them with the drugs usually given in such cases.

In the case of thyroxin with its very large percentage of iodine it is rational to employ it in some cases in which this drug seems beneficial. From another angle this status may be reversed because small doses of iodine appear to stimulate the normal function of the thyroid gland. If the subject has a normal thyroid it should be quite unnecessary to administer thyroxin, etc. The so-called physiological action of thyroid preparations which according to Dr. Sajous is believed to show that its limit of usefulness and safety is reached means only that the organism is making an effort to eliminate an excess of iodine in the body. It means that the thyroid can take up no more iodine and that the surplus must be expelled. The phenomenon of acute hyperthyroidism with its very rapid pulse, tremor, etc., as encountered in certain forms of goitre or when an excess of thyroid extract has been taken, is indicative of an excess of denutrition over assimilation. The failure of thyroid preparations to benefit certain forms of goitre with loss of gland tissue may be made good by combining them with ergotine which is necessary to contract the dilated blood vessels which characterize the disease. In regard to the future of gland therapy there is every prospect that it will become universal and that we shall look upon these preparations as special foods rather than drugs, quite apart from certain pharmacological activities of thyroxin, adrenaline, and pituitins. In this respect they should be classed with the necessary mineral ingredients of the body and the vitamins as food-drugs. Therapeutic extracts of most of the tissues and organs of the body are now in use but the commercial exploitation of these numerous products must not be regarded as an index of their usefulness.

Bibliography. Biedl, *Innere Sekretion* (Berlin, 1913); Sajous, *The Internal Secretions* (6th ed., Philadelphia, 1914); Vincent, *Internal Secretion and the Ductless Glands* (London, 1912); Harrower, *Practical Hormone Therapy* (New York, 1913); Kirkes, *Handbook of Physiology* (ib., 1914).

SECRET SERVICE. The name given to that department of a government whose business it is to detect crime and fraud, obtain information of various kinds, and render various services of a secret nature. Its duties are generally not defined and vary with the necessities that create them. In the United States the service is not centralized as it generally is abroad, and each department employs its own agents. The name has come to be generally applied to the Secret Service Division of the Treasury Department, organized in 1864 and charged chiefly with the detection and arrest of counterfeiters, the whole country being divided into 27 secret-service districts. Operatives from the division, however, are frequently detailed to work in other departments. Thus, during the Spanish-American War secret-service operatives rendered effective services in breaking up the Spanish secret-service organization in the United States. The Treasury Department also employs men to detect infractions of revenue laws. The War Department employs men to obtain information of various kinds, and within the Post Office Department there is a division of Post Office Inspectors and Mail Depredations, organized in 1872. Members of the Secret Service are also assigned to guard the President. This service was very active during the European War (1914 et seq.) in unearthing plots designed to interfere with the manufacture and shipping of war munitions to certain of the belligerents.

SECRET SOCIETIES, Patriotic-Political. Extended inquiry based on original and other data shows that a broad if not deep influence has been exercised over the political development of the United States for a century and a half by secret societies which form a chain extending practically from 1764 to date. They began with the Sons of Liberty in Maryland (1764–65), from which sprang the Tammany (Tamina or Tamanend) societies. The Society of Red Men, at the time of the War of 1812, arose as a modified Tammany, but died early in the thirties. Surviving members were absorbed by the Improved Order of Red Men (q.v.), organized as a secret beneficiary society. The Antimasonry agitation (1826–36) explains an interregnum in the life of all secret societies, filled in this instance by a nonsecret Native American party which appeared in New York and Philadelphia in 1835. Later, in the forties, came the elder and after it the Junior Order of United American Mechanics, the patriotic order Sons of America, and the Brotherhood of the Union. Then followed the secret society dubbed the Know-Nothing, which was later the American party, in which members of the four others merged. The collapse of the last named came with the Civil War, followed after the war by the resuscitation of the two orders of United Mechanics, the Sons of America and the Brotherhood of the Union. Following this came the formation in 1888 of the American Protective Association—the A. P. A.—into which from 1890 to 1900 were merged most of the members of the four older and many newly created so-called patriotic or patriotic-political secret societies. The opening decade of the twentieth century found surviving only the "big four" of the chain of patriotic-political secret societies, members of which have tried, through them or other secret organizations, to affect the political destinies of the Republic. The four epochs in the life of these societies include the periods of the Revolutionary War, the War of 1812, the period which found its climax in the supreme struggle by and defeat of the Know-Nothing party movement, and lastly the final decade of the nineteenth century. Since 1900 the four societies, which have been recruiting stations of the movement for the past 70 years, have grown and been prosperous and have worked perhaps less politically and more patriotically, but have stood persistently for the principles which they openly profess.

In the Revolutionary period the Sons of Liberty were opposed to taxation without representation and worked for the independence of the Colonies. By political evolution they became Tamina societies, named after St. Tamina, an imaginary Indian chief, to emphasize their Americanism. They aimed originally to maintain the independence of the States and the political rights of the masses against a then suspected tendency on the part of the military to dominate and a presumed aim to control on the part of those referred to as the aristocracy. Near the close of the eighteenth century these organizations were one of the principal political levers to discriminate in favor of nativism, one outcome being the passage of the Alien and Sedition Laws of 1798. They attacked not only Royalists but Federalists, the Society of the Cincinnati with hereditary membership, and the writings of Paine and Voltaire. The New York City Tammany Society or Columbian Order, founded in 1789 and still in existence, came from the group of Maryland-Pennsylvania-New Jersey Tamina or Tammany secret societies. It is not Tammany Hall, but the landlord of the latter political organization. A number of the more eminent Democrats of the country who have consistently opposed Tammany Hall have been members of the Tammany Society or Columbian Order.

The Society of Red Men of 1812 and thereafter, based on Sons of Liberty and St. Tamina ceremonials and customs, was formed for beneficiary purposes and defense of the country. It spread from near Philadelphia, through Delaware, New York, and Pennsylvania. The Red Men soon became a little more aristocratic in their membership and tendencies than their predecessors. It is recorded that clannishness, the Antimasonic agitation of 1826–36, and inroads caused by conviviality conspired to cause the death of the society, members of which formed or joined an Improved Order of Red Men (q.v.).

But with the reawakening of pronative American sentiment, which had slumbered during the "era of good feeling," after the expansion of immigration early in the third decade of the last century, so-called patriotic-political agitation took a new turn. Then it was that public discussion arose over the desirability of insisting on having the Bible read in the public schools, whether or not public funds should be appropriated for parochial schools or other sectarian institutions—controversies which have continued from time to time to this day. This turn to political discussion was given impetus at the time by the introduction from Ireland into the United States in 1837 of the Roman Catholic secret society the Ancient Order of Hibernians (q.v.). Then came the Native American party (nonsecret), which carried its particular political torch until the secret Order of the United American Mechanics (q.v.) appeared in cooperation at Philadelphia in 1845. Within a

few years this gave birth to the Junior Order of United American Mechanics, originally a connected junior society, but which later became much the larger of the two and wholly independent. The patriotic order Sons of America (q.v.), similarly animated and inspired, appeared in 1847 and the Brotherhood of the Union in 1850. The largest of the four, the Junior Order of United American Mechanics, has, as reported, stood quite consistently in opposition to union between church and state; has demanded that the Bible (not the Douai revision) be read in the public schools; legislation to have the flag displayed on public schools; but has disclaimed sectarian bias and says it is ever cultivating loyalty to country. None of these societies has a religious test for membership. In 1852 native American party sentiment flamed up in the secret, oath-bound political organization Sons of '76 or the Order of the Star Spangled Banner. As its members professed to outsiders not to know anything about it, the party was popularly called the Know-Nothings (q.v.). Into it were finally swung most of the members of the four secret societies just referred to and thousands of others in sympathy with the movement, but the organization declined rapidly after 1856 until obliterated by the Civil War.

After the Civil War the two orders of United Mechanics, the Sons of America and the Brotherhood of the Union, slowly emerged from the era of Know-Nothing obscurity. Interest, if nothing more, was then added to the continued activities of these patriotic-political secret societies by the introduction into the United States in 1870 of the Loyal Orange Institution, better known as the Orangemen (q.v.), a patriotic Irish secret society of strong Protestant proclivities. Beginning about 1873 more pronative and so-called anti-Roman Catholic secret societies arose. Many of their founders and later members had been affiliated with the four orders previously referred to. Among the larger of the new links in the chain were the Order of the American Union, Order of United Deputies, and a revival of the American Protestant Association which had lived during the Know-Nothing period, all of which, with a score or more of imitating secret societies, ran a race for popularity among those to whom they appealed. Whatever their professed political or patriotic motives, their visible activities were generally in antagonism to the spread of Roman Catholicism in the United States and were evinced by opposition to the election of Roman Catholics to public office. This made the situation ripe for a similar secret society which should do for all these orders what the Order of the Star Spangled Banner, or Know-Nothing party, did in the way of amalgamating like sympathetic political sentiment in its day. The American Protective Association, or A. P. A., was born at Clinton, Iowa, in 1888, and into this were merged without disintegration of the organizations a very large proportion of the membership of the other societies named. The attraction of the A. P. A. for much of the membership of other patriotic societies was undoubtedly based on the former's being avowedly political, organized with intent to exercise coordinated political influence at the polls. Its admitted attitude was that a Roman Catholic is such first and a citizen of the United States afterward. The supreme effort of the A. P. A. was seen in the political campaigns of 1896, following the convention at Washington in 1895, at which nearly all secret societies in harmony with it participated and planned for political action. Writers of standing have charged, and it has not been denied, that a number of State elections were decided by the combined A. P. A. sentiment conjured at the polls. As late as 1915 it was no secret that politicians running for office in States where the Junior Order of United American Mechanics are numerically strong have often had the foresight to gauge their political strength with respect to possible opposition from that society. The A. P. A. and the tide on which it rose subsided shortly after the opening of the twentieth century.

From no taxation without representation, independence, and democracy 150 years ago to defense of the Union in 1812, to nativism, opposition to union between church and state, and opposition to Roman Catholics for public office is a far cry; yet those are some of the shibboleths of more than 30 secret societies which, with a brief interval, have preserved a connected chain for a campaign for what they considered patriotic, politically, for more than 150 years. The tide represented by the movement—suggestive of British Orangeism, a lack of toleration and full appreciation of what is due to and may be expected from others—has been running out since the beginning of the twentieth century. It may therefore be a question whether the day of the dark lantern in politics—political warfare from behind closed lodge-room doors—has not virtually passed or is not about to disappear.

SECTION (Lat. *sectio*, from *secare*, to cut). In architecture, the delineation of buildings on a vertical plane through any part of them—as a *plan* is the horizontal projection.

SECTOR (Lat. *sector*, cutter, from *secare*, to cut). An instrument used in mathematical drawing and calculations, which consists of two strips of wood, ivory, or metal jointed together like a carpenter's foot rule. The centre of the joint is the vertex of the angle whose sides are formed by the inner edges and any of the corresponding pairs of lines drawn from the joint obliquely along the rule. These oblique lines are graduated in different ways, so as to give, on each limb, a line of equal parts, a scale of chords, scales of sines, tangents, and secants, a line of polygons, etc. (all of which are graduated from the centre of the hinge, which is their zero point), besides a number of common scales on the blank portions of the sector. The special use of this instrument is in the finding of a fourth proportional to three given quantities. This instrument becomes more inaccurate as the angle formed by the limbs increases.

SECTOR. In geometry, a portion of a circle (q.v.) included between two radii and the intercepted arc of the circumference. Its area is expressed by one-half of the product of the length of the arc and the radius of the circle.

SEC'ULAR GAMES (Lat. *ludi sæculares*). Roman games deriving their name from the theory that their performance marked the close of a *sæculum*, or period of extreme duration of human life. This was reckoned as 100 years or, after the time of Augustus, 110. The earliest Secular Games occurred during the great plague of 463 B.C., and at this time the ceremony consisted in driving a nail in the wall of the temple of Jupiter on the Capitol, a symbolical act, apparently, whose purpose was to hold the plague fast and to bring it to an end. This was repeated in 363 and 263. The distress of the First Punic

War led to the consultation of the Sibylline Books (q.v.), and in 249 B.C. a new *sæculum* began with the performance of *ludi Tarentini* at a spot in the Campus Martius called Tarentum. The celebration occupied three nights, and on each a black bull and a black cow were offered at a subterranean altar, uncovered for the occasion, to Dis Pater and Proserpina, whose worship was thus introduced to Rome. (See PLUTO.) This celebration obviously was essentially a funeral ceremony for the age just ended. The rite was repeated in 146 B.C., but the civil wars seem to have prevented the next repetition. In 17 B.C. Augustus celebrated new and splendid *ludi sæculares*, which marked the opening of a new era and which are known to us from the official record discovered in 1891. The old nocturnal offerings were continued at the old altar, but the deities honored were now the Fates, Eileithyia (q.v.),, helper in childbirth, and the Earth. Three days were also given to splendid processions and offerings in honor of Jupiter Optimus Maximus, Juno Regina, and Apollo and Artemis of the Palatine. On the third day the procession moved from the Palatine to the Capitol and back, led by a chorus of 27 youths and as many maidens, who sang the *Carmen Sæculare* of Horace (q.v.). These games were repeated in 88 A.D. by Domitian and in 204 A.D. by Septimius Severus. Another series in celebration of the foundation of the city was begun in 47 A.D. (800 A.U.C.) and repeated in 147 and 248. Consult Georg Wissowa, *Religion und Kultus der Römer* (2d ed., Munich, 1912), and V. Gardthausen, *Augustus und seine Zeit*, vol. ii (Leipzig, 1891–1904). For the inscription giving the official record for the games of 17 B.C., referred to above, consult: R. A. Lanciani, *Pagan and Christian Rome* (Boston, 1893); Theodor Mommsen, in *Ephemeris Epigraphica*, vol. viii (Rome, 1899); "Sæcularfeier," in Friedrich Lübker, *Reallexikon des klassischen Altertums* (8th ed., Leipzig, 1914).

SEC'ULARISM (from *secular*, from Lat. *secularis, sæcularis*, relating to an age or period, worldly, from *seculum, sæculum*, age, period, world). The term applied to a system of ethical and social principles advocated about 1846 by G. J. Holyoake (q.v.). As its name implies, it concentrates its attention upon the present life, neither denying nor affirming the existence of another. It inculcates an ethics not dependent in any way on religion, although it does not formally deny the truth of any religion. It is, in fact, utilitarianism cut loose from all connection with theology. A society was formed in London, of which Holyoake was president, but in 1858 Charles Bradlaugh (q.v.) succeeded him, and under his administration the society carried on a political propaganda, advocating disestablishment and disendowment of the Church of England, abolition of the House of Lords, and many economic changes. Consult G. J. Holyoake, *Principles of Secularism* (London, 1855), and R. A. Armstrong, *Agnosticism and Theism in the Nineteenth Century* (ib., 1905).

SECULAR VARIATION. See TERRESTRIAL MAGNETISM.

SECUNDERABAD, sē-kŭn'dēr-ä-bäd'. A suburb and military cantonment of Hyderabad (q.v.), Nizam's Dominions, India.

SECUN'DUS, JOANNES (1511–36). A Dutch poet, Jan Nicolai Everaerts by name. He was born at The Hague and was educated for the law in Bourges, but devoted himself to poetry, painting, and sculpture. In 1533 he went to Toledo as secretary to the Cardinal Archbishop Tavera. After his death was published *Basia*, a collection of Latin love poems distinguished by their classic beauty. His elegies, odes, epistles, and epigrams were collected in 1541 as *Opera Poetica*. His *Opera Omnia*, edited by P. Bossche, appeared in 1821 in two parts.

SECURITE. See EXPLOSIVES.

SECURITY (Lat. *securitas*, freedom from care, from *securus*, free from care, from *se-*, apart + *cura*, care, anxiety). Instruments or property which, in contemplation of law, render the enjoyment or enforcement of a right more secure. A personal security is a promise or obligation, such as a negotiable instrument or a bond given by a debtor or by a third person, in addition to the original liability intended to be secured. Even when a debtor gives his own promissory note or check or bill of exchange for the debt, this new engagement is properly spoken of as a security, because his liability thereon is more easily proved than on the original debt. A security on property exists when the property is mortgaged or pledged to secure a debt or liability, or when by a rule of law the creditor is entitled to hold the property until a particular liability to him is discharged.

Securities are ordinarily specific, but at times they are shifting or floating. An example of the latter class is afforded by a chattel mortgage on property thereafter to be acquired by the mortgagor, or by corporation debentures which are made a charge on the stock in trade and book debts of the corporation. As soon as the mortgagee or debenture holder takes possession of the property or institutes proper proceedings for the enforcement of his rights the security becomes specific. Securities may originate either in the agreement of parties, which is the more common case, or in a rule of law. The seller's lien is of the latter class. This has its origin in the law merchant (q.v.), which accords to the unpaid seller of goods the right, in certain cases, even after title has passed to the buyer, to retain possession until the price is paid.

Under State laws exempting public securities from taxation it has been held that this term does not include the bonds of railroads and similar corporations, but is limited to securities issued under legislative sanction for the furtherance of public works.

Securities in judicial proceedings are of various kinds, but their purposes and form are generally regulated by statutes which should be examined in each jurisdiction. Consult: B. T. Hainer, *Treatise on the Modern Law of Municipal Securities* (Indianapolis, 1898); A. R. Butterworth, *Bankers' Advances on Mercantile Securities* (London, 1902); L. A. Jones, *Treatise on the Law of Corporate Bonds and Mortgages* (Indianapolis, 1907).

SECURITY OF PERSON. One of the fundamental rights of persons recognized and enforced by the common law and now guaranteed by the United States Constitution and by the constitutions of most of the States. It comprises those personal rights and privileges and immunities which go to make up the Bill of Rights under the English Constitution and which became fundamental in the American Colonies. Many of these are traceable to Magna Charta, and they were confirmed and their number added to by the Petition of Right (Charles I) and by the Bill of Rights of the revolution of 1688.

The following is an enumeration of the more important rights of personal security: that no one shall be required to answer for an infamous crime unless he shall have been charged with the commission of the crime by a presentment or indictment of the grand jury; that no person shall be liable for the same offense to be twice placed in jeopardy of life or limb; that one charged with the commission of a crime shall not be compelled to be a witness against himself; that he shall be entitled to trial by jury and at the trial that he shall be confronted with the witness against him; that he shall be entitled to have compulsory process to compel the attendance at the trial and the testimony of witnesses in his favor; that excessive bail shall not be required of him, and that cruel and unusual punishments shall not be imposed; that no bill of attainder or *ex post facto* law shall be passed; and that no person shall be deprived of life, liberty, or property without due process of law. See ATTAINDER; BAIL; BILL OF RIGHTS; CONSTITUTIONAL LAW; JEOPARDY; MAGNA CHARTA; PETITION OF RIGHTS; PRIVILEGE; ETC.

SEDAINE, sē-dān′, MICHEL JEAN (1719–97). A French dramatist, born in Paris, the son of an architect. Sedaine was early orphaned. He became a mason and builder and in 1753 published poems of merit. Then he turned to the stage, attracted the notice of Diderot, and won general applause by the now classic *Le philosophe sans le savoir* (1765) and *La gageure imprévue* (1768), natural and original bourgeois comedies which alone survive of his work. He became an Academician and secretary for architecture in the division of fine arts and died in Paris prosperous, popular, and respected. His *Œuvres choisies* were published in three volumes in 1813. Consult T. E. Oliver, "Michel-Jean Sedaine: Le philosophe sans le savoir," in *University of Illinois Studies* (Urbana, 1913), the best recent study of Sedaine.

SEDALIA, sē-dā′lī-à. A city and the county seat of Pettis Co., Mo., 188 miles west of St. Louis, on the Missouri Pacific and Missouri, Kansas, and Texas railroads (Map: Missouri, C 3). Leading features are the George R. Smith College (colored), the Convent School of the Sisters of St. Joseph, the Carnegie Library, the hospital of the Missouri, Kansas, and Texas Railroad, St. Mary's Hospital, Convention Hall, the Federal building, the county courthouse, and Liberty Park. The State fair is held in Sedalia. The city has important railroading and manufacturing interests. Shops of the Missouri Pacific and the Missouri, Kansas, and Texas railroads are here, and there are also ironworks, foundries, poultry and beef and pork packing establishments, a distillery, breweries, flour mills, a creamery and manufactories of agricultural implements, candy, brooms, shoes, carriages, overalls, trousers, and shirts. Founded by Gen. G. R. Smith in 1861, Sedalia was used as a United States military station during the Civil War. It was captured and held for several days by a Confederate force in 1864. Pop., 1900, 15,231; 1910, 17,822; 1915, 19,187; 1920, 21,144.

SEDAN, sē-dăn′; *Fr. pron.* se-dăN′. The capital of an arrondissement in the Department of Ardennes, France, 164 miles northeast of Paris, on the Meuse River. It was formerly an important fortified town and the scene, in 1870, of the disastrous defeat and capitulation of the French army of MacMahon. (See SEDAN, BATTLE OF.) The fortifications have been demolished, and Sedan at present is mainly a residential and industrial town. The chief buildings are the parish church, the college, and the museum, and there are interesting remains of the fifteenth-century castle. The town is noted for its manufactures of cloth, and there are also considerable coal and iron mining interests in the vicinity. Sedan chairs are said to have been first made here. Pop., 1901, 19,349; 1911, 19,599.

SEDAN, BATTLE OF. In the latter part of August, 1870, Marshal MacMahon set out from Chalons for the purpose of effecting the relief of Metz, where Bazaine (q.v.) had been locked up by the German forces, after the series of engagements terminating with the battle of Gravelotte (q.v.). The third and fourth German armies, by forced marches, succeeded in barring the way to Metz and pressed the French northward towards the Belgian frontier, which it was a part of the German plan to compel them to cross. MacMahon, however, after several days' fighting, chose the alternative of throwing himself into the fortress of Sedan and occupied the heights which surrounded the fortress on the east, north, and west. The Germans now proceeded to encircle the French forces, whom they outnumbered two to one. The battle began early on the morning of September 1. While the Württemberg troops were assigned to hold the line of French retreat to Mézières, the Bavarians, Prussians, and Saxons, with the Guard, delivered an attack along the entire French line. MacMahon was wounded in the first hours of fighting, and to the conflict of authority between Generals Ducrot and Wimpffen was due no little of the confusion which followed. The most desperate fighting occurred at the village of Bazeilles, to the east of Sedan. In the late afternoon the French had been driven from their positions, and the Germans had planted on the heights around Sedan a circle of 500 cannon, under whose fire the enemy was helpless. The French were driven back on Sedan, and at four o'clock the bombardment of the town began. The futility of resistance was apparent, and by order of the Emperor Napoleon III, who was present in Sedan, a flag of truce was raised. On September 2 General Wimpffen arranged with Bismarck and Moltke the terms of capitulation. Nearly 2900 officers and 83,000 men laid down their arms and were made prisoners, with the Emperor. The French loss in battle was 17,000 dead and wounded. Three thousand men succeeded in escaping into Belgium. The German loss comprised 470 officers and 8500 men killed and wounded. In Paris the news of the capitulation of Sedan led to the overthrow of the Second Empire.

SED′ATIVES (OF. *sedatif*, Fr. *sédatif*, from Lat. *sedare*, to calm, causative of *sedere*, to sit). Agents which exert a quieting influence upon the system or any part of it either by diminishing pain or excitability or by lessening functional activity. Sedatives may have a general or local action. General sedatives include chloroform, ether, and the hypnotics (q.v.), such as chloral. Local sedatives are cold, heat, cocaine, opium, aconite, etc. Typical respiratory sedatives are dilute hydrocyanic acid, squills, ipecac, and veratrine. Digitalis, aconite, and nicotine are circulatory sedatives. Among the drugs which have a soothing effect upon the nerves and spinal centres are potassium and sodium bromides, gelsemium, and physostigmine. Certain drugs are sedative to one organ or system and irritant to another,

or they may be sedative in minute doses and irritant in large; any classification, therefore, is apt to be misleading. See also ANÆSTHETIC; HYPNOTICS; NARCOTICS.

SED'DON, JAMES ALEXANDER (1815–80). An American jurist and public official, born at Falmouth, Stafford Co., Va. He studied law at the University of Virginia and began practice in Richmond. He was a Democratic member of Congress in 1845–51. In February, 1861, he was a Virginia delegate to the Peace Convention held in Washington and presented a minority report recommending the adoption of amendments to the Constitution suggested by J. J. Crittenden, which specifically recognized the right of peaceable secession. He was a member of the First Confederate Congress and on Nov. 21, 1862, was appointed Secretary of War by President Davis. He resigned in January, 1865.

SEDDON, RICHARD JOHN (1845–1906). A New Zealand statesman, born at Eccleston in Lancashire, England. In 1863 he established himself in Australia as a mechanical engineer and subsequently removed to New Zealand, where he entered the colonial Parliament in 1879. In 1891–93 he was Minister of Mines, and in the latter year became Premier, retaining that office till his death and combining with it as many as four or five cabinet portfolios simultaneously. He was a prime mover in the policy of state Socialism. Seddon attended the conference of colonial premiers in London in 1897 and in 1902. See NEW ZEALAND, *History*.

SEDDUL-BAHR. See SIDD EL BAHR KALESI.

SEDGE'MOOR. A barren tract of land in Somersetshire, England, between King's Weston and Bridgewater, 5 miles southeast of the latter place. It is noted as the battlefield where the Duke of Monmouth (q.v.) was defeated by the troops of James II.

SEDGLEY, sĕj'lĭ. A manufacturing town in Staffordshire, England, suburban to Wolverhampton. Pop., 1901, 15,951; 1911, 16,527.

SEDGWICK, ADAM (1785–1873). An English geologist. He was born March 22, 1785, at Dent, Yorkshire, graduated at Trinity College, Cambridge, in 1808, and was ordained a priest of the Church of England in 1816. A reputation for general scholarship rather than for scientific knowledge led to his election in 1818 to the Woodwardian professorship of geology at Cambridge, but he soon became known for his work in this field. He was one of the founders of the Cambridge Philosophical Society in 1819 and read many of his papers before it. Besides his professorial work Sedgwick did much to promote the general study of natural science at Cambridge, was active in university administration, and continued to serve as a clergyman. He became prebendary of Norwich in 1834 and declined the deanery of Peterborough in 1853. His many papers contributed to the *Transactions of the Royal Society* and the *Quarterly Journal of Geology* describe his investigations in the Isle of Wight, Devonshire, Cornwall, Yorkshire, north Wales, the English Lake District, and west Somersetshire. In studying the rock formations of north Wales he developed a new stratigraphical group to which he gave the name Cambrian. With Sir Roderick Impey Murchison (q.v.) he established also the Devonian system (q.v.) and showed its extensive development in Europe. A misunderstanding between the two geologists with regard to the upper limits of the Cambrian system (q.v.) led to a prolonged controversy which was not settled during the lifetime of either, but remained open until 1879. Sedgwick was elected president of the Geological Society in 1831 and of the British Association for the Advancement of Science in 1833. He received the Wollaston medal of the former in 1851 and the Copley medal of the Royal Society in 1863. He died Jan. 27, 1873. In his honor at Cambridge the Sedgwick prize was instituted in 1865 and the Sedgwick Museum was opened in 1903. His publications include: *On the Geological Relations and Internal Structure of the Magnesian Limestone* (1828); *A Discourse on the Studies of the University of Cambridge* (1832; 5th ed., 1852); *On the Physical Structure of Devonshire* (1839), with Sir R. I. Murchison; *A Synopsis of the Classification of the British Palæozoic Rocks* (1855). Consult Clark and Hughes, *Life and Letters of the Reverend Adam Sedgwick* (2 vols., Cambridge, 1891), and Sir Archibald Geikie, *The Founders of Geology* (London, 1897).

SEDGWICK, ANNE DOUGLAS (MRS. BASIL DE SELINCOURT) (1873–). An American novelist, born at Englewood, N. J. From her tenth year she lived abroad, chiefly in Paris and in London. In Paris she studied painting for several years, and she exhibited at Champs de Mars. Her writings, marked by penetrating character study, include: *The Dull Miss Archinard* (1898); *The Confounding of Camelia* (1899); *The Rescue* (1902); *Paths of Judgment* (1904); *The Shadow of Life* (1906); *A Fountain Sealed* (1907); *Amabel Chaunice* (1908); *Franklin Winslow Kane* (1910); *Tante* (1911); *The Nest* (1912); *The Encounter* (1914). Consult H. D. Sedgwick, *The New American Type and Other Essays* (Boston, 1908).

SEDGWICK, ARTHUR GEORGE (1844–1915). An American lawyer and editor, great-grandson of Theodore Sedgwick (1746–1813) and son of Theodore Sedgwick (1811–59). He was born in New York City and graduated from Harvard in 1864 and from the law school there in 1866. During the Civil War he was a second lieutenant in the Twentieth Massachusetts Regiment and was imprisoned at Libby. He was an associate editor of the *American Law Review* until 1872, when he became an assistant editor of the *Nation*. After 1881 for a time he served as an editor of the New York *Evening Post* and until 1905 contributed to the press. He lectured on law at the Lowell Institute, Boston, in 1885–86 and delivered the Godkin lectures at Harvard in 1909. Sedgwick committed suicide at Pittsfield, Mass. Besides editing an edition of his father's *Measure of Damages* he was author of *Elements of Damages* (2d ed., 1909) and the Godkin lectures *Democratic Mistakes* (1912).

SEDGWICK, CATHERINE MARIA (1789–1867). An American author, born in Stockbridge, Mass., the daughter of Judge Theodore Sedgwick. She was head of a girls' school for nearly half a century. In 1822, with the encouragement of her brother, Theodore Sedgwick (q.v.), she published *A New England Tale*, which was popular, and followed it in 1824 with *Redwood*. Then came a succession of novels, including the good Colonial romance *Hope Leslie* (1827) and culminating in *The Linwoods* (1835), her last and best novel. The series of novels was succeeded by one of popular stories, illustrating morals and domestic economy. Her later work included *Letters from Abroad to Kindred at Home* (1841), the result of a European trip. Although now little read, she was an important force in early American

culture. Consult *Life and Letters* by Mary E. Dewey (1871).

SEDGWICK, Daniel (1814–79). An English hymnologist. He was born in London, became a shoemaker, then a dealer in second-hand books. In 1859 he began to reprint rare hymns under the title of *Library of Spiritual Song* and in 1860 published *A Comprehensive Index of Many of the Original Authors and Translators of Psalms and Hymns* (2d ed., 1863). His knowledge was wide, but he was hampered by lack of education. Julian's *Dictionary of Hymnology* owes much to his manuscripts, which are preserved in the Church House, Westminster.

SEDGWICK, Ellery (1872–). An American editor, brother of H. D. Sedgwick. He was born in New York City and graduated from Harvard in 1894. In 1895–96 he taught at the Groton (Mass.) School. Subsequently he was assistant editor of the *Youth's Companion* at Boston (1896–1900) and in New York editor of *Leslie's Monthly Magazine* (1900–05) and the *American Magazine* (1906–07). For short periods he was associated with *McClure's Magazine* and with the publishing house of D. Appleton & Co., in 1909 returning to Boston to be editor of the *Atlantic Monthly* and president of the Atlantic Monthly Company. In 1915 he was elected to the National Institute of Arts and Letters. From his pen came *The Life of Thomas Paine* (1899).

SEDGWICK, Henry Dwight (1861–). An American lawyer and author, brother of Ellery Sedgwick. He was born at Stockbridge, Mass. Admitted to the bar in 1884, he practiced law in New York from 1885 to 1898. He was honored with membership in the National Institute of Arts and Letters. His books are: *The Letter of Captain Cuellar* (1896); *The Life of Father Hecker* (1897); *The Life of Samuel Champlain* (1901); *Essays on Great Writers* (1902); *The Life of Francis Parkman,* in the "American Men of Letters Series" (1904); *A Short History of Italy* (1905); *The New American Type and Other Essays* (1908); *Italy in the Thirteenth Century* (1912).

SEDGWICK, John (1813–64). An American soldier, born at Cornwall, Conn. He graduated at West Point in 1837, saw active service in the Second Seminole War, served with distinction in the Mexican War, and received the brevets of captain and major. On Aug. 25, 1861, he was promoted from lieutenant colonel to colonel and six days later received the command of a brigade. He served with efficiency, as a division commander, in the Peninsular campaign and at Antietam was twice wounded, but remained upon the field, to inspire his troops, for two hours after receiving the second wound. In December, 1862, he was appointed a major general and in February, 1863, was placed in command of the Sixth Army Corps. In Hooker's Chancellorsville campaign he captured Marye's Heights, near Fredericksburg, and after Hooker's defeat displayed great skill in withdrawing across the Rappahannock. When Lee invaded Pennsylvania, Sedgwick, by a remarkable forced march, reached Gettysburg in time to take an important part in the last two days of the battle. In the following November he succeeded by a skillful manœuvre in capturing at the Rapidan 1500 men of General Early's division. He took part under General Grant in the battles of the Wilderness, but was killed on May 9, 1864, while superintending the planting of some guns at Spotsylvania. A monument made from cannon captured by his corps was erected in his honor at West Point in 1868.

SEDGWICK, Robert (c.1590–1656). An American colonist, born in Woburn, Bedfordshire, England. He settled at Charlestown, Mass., in 1635, where he became a successful merchant and for many years represented that town in the General Court. He was active in organizing the Ancient and Honorable Artillery Company, of which he became captain in 1640. In 1652 he was appointed commander of all the Massachusetts militia. With John Winthrop, Jr., and others he established in 1643–44 the first ironworks in the United States. Under authority from Cromwell he drove the French from the Penobscot region in 1654 and in 1655 accompanied the expedition which captured Jamaica. Just before his death there Cromwell promoted him major general and gave him sole command.

SEDGWICK, Theodore (1746–1813). An American jurist, born in Hartford, Conn. He attended Yale College, but left in 1765 without graduating. In the following year he was admitted to the Massachusetts bar and practiced in Great Barrington and in Sheffield. One of his most famous cases was that of Elizabeth Freeman, an escaped slave. The trial took place about the year 1781, and the court gave the woman her freedom on the ground that slavery was incompatible with the Massachusetts Bill of Rights. In 1776–77 Sedgwick served in the expedition against Canada as an aid to Gen. John Thomas, was later several times a member of the Massachusetts Legislature, and in 1785–86 was a member of the Continental Congress. In the following year he assisted in putting down Shays's Rebellion, in 1788 was Speaker of the Massachusetts House, and in the same year was a member of the Massachusetts Convention that ratified the Federal Constitution. From 1789 until 1801 he was a member of Congress and for brief periods was Speaker of the House and President of the Senate. From 1802 until his death he was judge of the Massachusetts Supreme Court.

SEDGWICK, Theodore (1811–59). An American law writer, born in Albany, N. Y. After graduating at Columbia College (1829) he was attached to the United States Legation at Paris in 1833–34. In 1858 he became United States district attorney for the southern district of New York. His writings include his edition of the political writings of William Leggett (2 vols., 1840); *Treatise on the Measure of Damages* (1847; 8th ed., 1891), a work of much importance; *Treatise on the Rules which Govern the Interpretation and Application of Statutory and Constitutional Law* (1857; 2d ed., 1874).

SEDGWICK, William Thompson (1855–1921). An American biologist and hygienist, born at West Hartford, Conn., and educated at Sheffield Scientific School, Yale (Ph.B., 1877), and at Johns Hopkins University (Ph.D., 1881), where from 1880 to 1883 he taught biology. Thereafter he was a member of the faculty of Massachusetts Institute of Technology, eventually becoming professor of biology and public health. Sedgwick served as biologist to the Massachusetts State Board of Health from 1888 to 1896 and after 1897 as curator of Lowell Institute, Boston. He was president of the Society of American Bacteriologists (1900), of

the American Society of Naturalists (1901), and of the American Public Health Association (1914), and held high office also in various civil-service reform organizations. Besides many papers he published: *General Biology* (1886), jointly; *Principles of Sanitary Science and Public Health* (1902); *The Human Mechanism* (1906), jointly.

SEDILLA, ANTONIO DE. See ANTONIO DE SEDILLA.

SÉDILLOT, sā'dē'yō', CHARLES EMMANUEL (1804–83). A French surgeon, member of a family of well-known physicians. He was born and educated at Paris (M.D., 1829), from 1825 to 1872 served as surgeon in the army, became *agrégé* of the medical faculty of the University of Paris in 1835, and in 1837 served in the African campaign. Four years later he went to Strassburg to be professor of surgery there, and in 1869 he became *médecin inspecteur des armées* and president of the Strassburg Military Academy. He also took an active part in the Franco-German War of 1870–71. In 1872 he was elected to the Academy of Sciences. Sédillot introduced gastrostomy into France, performing the first (although a fatal) operation in 1849. He was also an advocate of urethrotomy, which he successfully carried out. Among his works are: *Manuel complet de médecine legale* (1834; 2d ed., 1836); *Campagne de Constantine de 1837* (1838); *Recherches sur le cancer* (1846); *Traité de médecine opératoire* (1846; 3d ed., 1865–66); *De l'infection purulente, ou pyoémie* (1849); *De l'évidement des os* (1860; 2d ed., 1867); *Du relèvement de la France* (1874).

SEDILLOT, LOUIS PIERRE EUGÈNE AMÉLIE (1808–75). A French Orientalist, born in Paris. He was successively professor at various colleges and in 1832 became secretary of the Collège de France, but was chiefly occupied in the study of science among the Orientals. His numerous monographs include: *Manuel de chronologie universelle* (1835; 6th ed., 1865); *Mémoires sur les systèmes géographiques des Grecs et des Arabes* (1842); *Matériaux pour servir à l'histoire comparée des sciences mathématiques chez les Grecs et les Orientaux* (1845–49); *Histoire des Arabes* (1854); *Courtes observations sur quelques points de l'histoire de l'astronomie et des mathématiques chez les Orientaux* (1863).

SED'IMEN'TARY ROCKS (from *sediment,* Lat. *sedimentum,* subsidence, settling, from *sedere,* to sit). One of the main petrographic divisions, comprising all those rocks that are of secondary origin and have accumulated by the action of water or of the wind. See ÆOLIAN ACCUMULATIONS; AQUEOUS ROCKS; ROCK.

SEDIMENTATION. See SEWAGE DISPOSAL.

SEDITION, sē-dĭsh'on (Lat. *seditio,* from *se-, sed-,* apart + *ire,* to go). The designation for conduct directed against the state or its authority and tending towards treason, but lacking the overt act, which is regarded as an essential part of the greater offense; the writing, publishing, or uttering words which tend to excite subjects or citizens to insurrection or otherwise to disturb the tranquillity of the state, but which do not amount to treason. See TREASON.

SEDITION LAWS. See ALIEN AND SEDITION ACTS.

SED'LEY, AMELIA. A gentle sentimental girl in Thackeray's *Vanity Fair.*

SEDLEY, SIR CHARLES (?1639–1701). An English dramatic poet. He was born at Aylesford, Kent, and was the posthumous son of Sir John Sedley, from whom he inherited his title. He was educated at Wadham College, Oxford, became a member of Parliament for New Romney in Kent after the Restoration, and stood high in the favor of Charles II. As a young man he was of dissolute habits and twice came under the ban of the law for riotous and indecent behavior. He supported the Revolution and opposed James II on account of the latter's seduction of his daughter, whom the King made Countess of Dorchester. He was esteemed by his contemporaries for his wit, satire, and dramatic works, the chief of which are: *The Mulberry Garden* (1668), a comedy; *Antony and Cleopatra* (1677), a tragedy; *Bellamira, or the Mistress* (1687), a comedy; *Beauty the Conqueror, or The Death of Mark Antony* (1702), a tragedy; *The Grumbler* (1702), a comedy; *The Tyrant King of Crete* (1702), a tragedy. Consult the memoir prefixed to his *Works* (London, 1778) and Max Lissner, *Sir Charles Sedley's Leben und Werke* (Halle, 1905).

SEDUC'TION (Lat. *seductio,* a leading astray, from *seducere,* to lead astray, from *se-,* apart + *ducere,* to lead). In law, in its broadest sense, the decoying or enticement of a servant away from his employment to his master's damage. By modern usage the term is generally, although not exclusively, applied to the persuasion of the servant to unlawful sexual intercourse with the seducer. Seduction by the common law was one of the numerous forms of tort for which the person injured might recover damage. The use of this form of action to recover for the loss of service of a servant, however, is now of infrequent occurrence. The action, however, is now important as affording a parent a means of recovery of damage from the seducer for unlawful intercourse with his daughter. For all practical purposes the effect of his action is to enable him to recover damage for the wrong done him as a parent, and the amount of his recovery is not limited to the actual financial loss. Historically and in legal contemplation, however, the parent's right to recover is based upon the loss of service of his daughter as a servant, and it seems not unlikely that originally the right to recover for seduction of a child did not differ in any particular from the right to recover for the enticement of a servant. To entitle the parent, therefore, to recover for the seduction of his daughter it was necessary for him to establish loss of the daughter's services as a consequence of the seduction. This is still the rule in England, but generally in the United States, by a relaxation of the rule, the parent may maintain the action if he has a legal right to the daughter's services during her minority, whether he is actually availing himself of them or not. This fact being established, however, he may recover not alone for loss of the daughter's services, but for the injury to his feelings and an additional amount as punitive damages.

In establishing loss of service or invasion of the parent's legal right to the daughter's services slight acts of service or a bare legal right to services will suffice. And whenever loss of such service or interference with the right follows as a direct result of the seduction, the seducer must respond in damages. While the birth of a child is not essential to the maintenance of such an action, it differs from actions

for criminal conversation in that damage will not be presumed from the act itself; some actual loss of service, however slight, must appear. At common law the person seduced had no right of action against the seducer, as the seduction was accomplished with the consent of the person seduced, and this was the rule even when the seduction was accomplished by fraud. In some states by statute the person seduced may maintain an action in her own right, although usually this may not be done unless a child is born as a consequence of the seduction, thus making the action analogous to a bastardy proceeding. Seduction was not a crime by the common law. Most of the States of the United States now have statutes making seduction of a woman of previous chaste character a crime. Generally they are applicable only to the seduction of unmarried women under promise of marriage, and subsequent marriage is not infrequently made a bar to prosecution for this offense. Consult authorities referred to under CRIMINAL LAW. See CRIMINAL CONVERSATION; HUSBAND AND WIFE.

SEDU'LIUS, CÆLIUS. A Christian poet of the earlier half of the fifth century. He wrote *Carmen Paschale,* an extant hexameter poem, in five books, on the history of the Old Testament; *Opus Paschale,* a prose version of the work, which is also extant; *Abecedarius,* an alphabetical hymn to Christ in 23 quatrains of iambic dimeters, remarkable for the partial employment of rhyme as a musical element; and *Veteris et Novi Testamenti Collatio,* a comparison of the Old and New Testaments in 55 elegiac couplets. The best editions are by Arevalus (1794) and Hulmer (1885). Consult: Hulmer, *De Sedulii Poetæ Vita et Scriptis* (Vienna, 1878); Leimbach, *Ueber den christlichen Dichter Sedulius* (Goslar, 1879); M. Manitius, *Geschichte der christlich-lateinischen Poesie* (Stuttgart, 1891); W. S. Teuffel, *Geschichte der römischen Literatur,* vol. iii (6th ed., Leipzig, 1913).

SEE, HORACE (1835–1909). An American consulting engineer and naval architect, born in Philadelphia, where he became a mechanical engineer. In 1871 he entered the employ of William Cramp and Sons and in 1879 was made their superintending engineer. He designed, and in some cases supervised during manufacture and trial, engines for the cruisers *Yorktown, Concord, Bennington, Philadelphia, Newark,* and *Vesuvius,* the steamship *Monmouth,* and other steamships and private yachts. In 1889 he removed to New York City and opened an office as a consulting engineer and architect. See was president of the American Society of Mechanical Engineers in 1888. More than any other one man, perhaps, he advanced the use of the double-compound, triple, and quadruple expansion engines. His device for the manufacture of perfect bearings and crank shafts did away with heating these parts before using the engine, and his hydropneumatic ash ejector discharging the ashes direct from the fireroom outside the vessel above the water line did away with dirt and noise and relieved the firemen of considerable work. He also introduced many other improvements in steam vessels.

SEE, SIR JOHN (1844–1907). A premier of New South Wales. He was born at Felling, Huntingdonshire, England, and went to Australia in 1853. In 1880 he entered the colonial Parliament, wherein he continued until 1904, as member for Grafton. He also held the offices of Postmaster-General (1885), Treasurer (1891–94), Chief Secretary and Minister of Defense (1899–1901), and Premier (1901–04). Ill health necessitated his retirement. He was created K.C.M.G. in 1902.

SEE, THOMAS JEFFERSON JACKSON (1866–). An American astronomer, born near Montgomery City, Mo. He was educated at the University of Missouri and at Berlin, where he took his Ph.D. in 1892 with a thesis of striking merit, the result of his researches into the origin of binary stars. From 1893 to 1896 he was head of the department of astronomy in the University of Chicago, during this period aiding in the organization of the Yerkes Observatory. He was astronomer at the Lowell Observatory (Flagstaff, Ariz.) in 1896–98 and after 1899 was professor of mathematics in the United States navy. On duty first at the Naval Observatory, Washington, and then at Annapolis, he took charge (1903) of the Naval Observatory on Mare Island, Cal. While connected with the Lowell Observatory he examined there and at Mexico City about 200,000 fixed stars between 15° and 65° south declination, leading to the discovery of about 600 new double stars and remeasurement of 1400 stellar systems. He also made many other researches. See was elected a fellow of the Royal Astronomical Society of Great Britain and of various other foreign as well as American societies. He wrote: *Die Entwickelung der Doppelstern-Systeme* (1893); *Researches on the Evolution of the Stellar Systems* (2 vols., 1896–1910); *Researches on the Physical Constitution and Rigidities of the Heavenly Bodies* (1904–06). He also published double-star catalogues and contributed to various scientific journals.

SEEBACH, zā'băG, MARIE (1834–97). A German actress. She was born at Riga, the daughter of an actor, and studied at Cologne for the opera. After engagements at several theatres and after several starring tours, in 1887 she accepted an engagement at the Royal Theatre in Berlin. Her principal rôles besides Gretchen were Klärchen in *Egmont,* Louise in *Kabale und Liebe,* Julia, Ophelia, Desdemona, and Jane Eyre, and later Maria Stuart, the nurse in *Romeo and Juliet,* and Lady Macbeth. In 1871 she visited the United States.

SEEBERG, zā'bĕrK, REINHOLD (1859–). A German Lutheran theologian, born at Pörrafer, Livonia. After studying at Dorpat (1878–82) and Erlangen (1882–84) he was connected with the former university as privatdocent and (1885–89) as associate professor and university preacher. At Erlangen he held the chairs of Church history and New Testament exegesis (1889–94) and of systematic theology (1894–98). Thereafter he was professor of the last-named subject at Berlin. His works are of especial importance in the history of dogma and in discussion of the relation of the Church to social problems. They include: *Der Begriff der christlichen Kirche* (1885); *Lehrbuch der Dogmengeschichte* (2 vols., 1895–98; 2d ed., 3 vols., 1907–13); *Die Kirche und die soziale Frage* (1897); *Grundriss der Dogmengeschichte* (1901; 3d ed., 1910); *An der Schwelle des zwanzigsten Jahrhunderts* (1901; 5th ed., *Die Kirche Deutschlands im 19. Jahrhundert,* 1904); *Die Grundwahrheiten der christlichen Religion* (1902; 5th ed., 1910; Eng. trans., *The Fundamental Truths of the Christian Religion,* 1908);

Das Abendmahl im Neuen Testament (1905; 2d ed., 1908); *Aus Religion und Geschichte* (2 vols., 1906–08); *Die kirchliche soziale Idee* (1907); *Offenbarung und Inspiration* (1908; Eng. trans., *Revelation and Inspiration*, 1910); *Sinnlichkeit und Sittlichkeit* (1909); *Alte und neue Moral* (1910); *System der Ethik* (1911); *Vom Sinn der Geschichte* (1913).

SEEBOHM, sē'bōm, FREDERIC (1833–1912). A British economic historian, born at Bradford. He was educated for the law, becoming a barrister at the Middle Temple in 1856. His *English Village Community*, published in 1883, at once placed him in the foremost rank of economic historians. Before the publication of that work the prevailing view was that primitive Anglo-Saxon society consisted of communal groups of freemen holding land in common (the mark), and that by the continual aggression of native and foreign leaders the village community had degenerated into the manor, in which the tenants, originally free, became serfs. Seebohm attempted to show that there is no satisfactory ground for believing that the free community ever existed in England. The similarity of the Roman villa and the manor is emphasized, the implication being that the mediæval manor is to be explained as an amalgamation of the Roman villa with the Germanic tribal system. Seebohm published two works dealing with early tribal relations, *The Tribal System in Wales* (1895) and *Tribal Custom in Anglo-Saxon Law* (1902). His other works are: *Oxford Reformers: John Colet, Erasmus, and Thomas More* (1867; new ed., 1914); *On International Reform* (1871); *Era of the Protestant Revolution* (1874; 2d ed., 1903); *Customary Acres and their Historical Importance* (posthumous, 1914).

SEED (AS. *sæd*, OHG. *sāt*, Ger. *Saat*, seed, connected with Lat. *serere*, to sow). A reproductive structure characteristic of the highest group of plants (seed plants). All flowering plants produce seeds, but not all plants that produce seeds have flowers.

A seed is an ovule (q.v.) transformed by the changes following fertilization. The integuments of the ovule give rise to the hard, impervious covering (testa), which often furnishes characters by which species and genera may be recognized. In many cases it also gives rise to appendages, such as wings (trumpet creeper), and silky hair (milkweeds), which evidently aid in wind distribution. In others long threads (spiricles) are discharged from short hairs when the seeds are wetted. While the testa usually develops as a hard, dry coat, it is sometimes berrylike (peony) or even like a stony fruit (magnolia). There may also be appendages or outgrowths, as in the fumitory family, which have been called strophioles (at the base of the seed) and caruncles (at the apex). Sometimes an extra more or less incomplete seed covering (aril) is developed, which is sometimes a membranous sac loosely inclosing the seed and open at the top (water lilies), but it is usually fleshy (yew, May apple, bittersweet, etc.). One of the most peculiar arils is the so-called mace of the nutmeg.

Within the testa of a typical seed is a region (the nucellus) often still more extensively modified. In its centre a large cavity (embryo sac) occurs within which the embryo is found, embedded in nutritive tissue (endosperm). The tissue of the nucellus between the embryo sac and the testa is called the perisperm and supplements the nutritive supply of the endosperm. Examples of modification: the embryo sac may enlarge and occupy the whole nucellar region, the perisperm being absent and the embyro sac abutting against the testa. Again, the embryo may absorb the endosperm and store its own body with nutritive material. In the mature bean seed both these phenomena occur, the testa containing only a large embryo gorged with food.

An ordinary dicotyledonous embryo contains three regions: (1) the hypocotyl, or small stemlike structure, which should not be confused with the later stem of the plant; (2) two cotyledons, or the seed leaves, usually very different in form from the later leaves; (3) between the cotyledons the plumule, a bud often very minute, which develops into stem and leaves. See EMBRYO.

Seeds contain various carbohydrate and proteid reserve foods, perhaps the most conspicuous among which in most seeds are starch (in cereals), oils (in castor bean), reserve cellulose (in the date). Proteid foods are also abundant; in some cereals they form a layer outside of the starch.

Many seeds, such as nuts, have no striking methods of dispersal, yet nut-bearing trees (e.g., oaks) are about as widely distributed as other trees. Many seeds, the so-called sling fruits, are scattered by mechanical expulsion, as touch-me-not (*Impatiens*). The commonest mechanical device for seed dispersal depends upon the desiccation and consequent rupture of the seed pod or capsule; in the Leguminosæ the pods twist and scatter the seeds. Many seeds are scattered by animals, either as so-called burs, which become attached to animals, or as fleshy fruits which are eaten. Many seeds are distributed by wind. Some (elm, maple) have winged seeds; others have cottony or feathery appendages (dandelion, milkweed). Various tumbleweeds (q.v.) may also be included in this group. In many cases water may carry light, easily floating seeds for great distances. See SPERMATOPHYTES.

SEED EATER. A very small, variegated, and sometimes brightly colored finch or grassquit of the genus *Sporophila*, several species of which are found in tropical America, feeding mainly upon grass seeds and the like, and are often familiar about gardens. One species, the black-faced (*Sporophila moreletti*), extends north into Texas and is distinguished by having the head and fore parts mainly black. It nests near the ground and lays eggs of the colors shown in the Plate of EGGS OF SONG BIRDS. See GRASSQUIT.

SEED PLANTS. The common name of the highest of the four great divisions of plants. See SPERMATOPHYTES.

SEED TESTING. The practice of determining the purity of seeds by visual examination and the viability by sprouting samples. The active crusade in seed testing may be said to have begun with Professor Nobbe, who established the first laboratory for testing seeds at Tharand, Saxony, in 1869, since when other laboratories have been established in most of the countries of Europe, and in some countries the quality of seed is a subject of governmental control. In the United States the seed-testing laboratories are in connection with the national Department of Agriculture and many of the State experiment stations. Legislation looking

to seed control has been enacted by some of the States. The need for seed testing prior to sale is well shown by the repeated report of seed of low vitality and often with admixtures of dead seed, sand, and weed seed. Many of the most troublesome weeds have been introduced in seeds purchased in good faith. Grass and clover seed are commonly mixed with similar seeds of less value. In countries where seed-control regulations exist samples of definite weight are sent to a testing laboratory, where their value is determined and a certificate issued. Based upon this report, the dealer guarantees the quality of his seed. As the laboratory tests are generally made under the most favorable conditions, a certain amount of latitude is allowed, and certain penalties are exacted when the samples are inferior to the standard. This system appears to have given satisfaction where adopted, and the quality of seed in the market is much better than formerly. In testing for purity a definite portion is weighed out from an average sample and the whole carefully examined under a magnifying glass and all foreign seed, chaff, earth, etc., rejected. The weight of the remainder expressed in per cent shows the purity. Of the pure seed a definite number—100 or 200—are germinated in specially devised apparatus. The sprouted seeds are counted every day and removed. This is continued from 10 to 30 days, according to the kind of seed, some sprouting much faster than others. At the end of the period, which is fixed for every kind of seed, the number of sprouted seeds expressed decimally represents the per cent of viable seed. The per cent of purity multiplied by the per cent of germinations, divided by 100, will show the intrinsic value of the seed. This is the fairest method of estimating the quality of seed, since the grower is interested in the number of plants he can obtain from a given quantity of seed. If a certain sample of seed should give 90 per cent purity and 90 per cent germination, its value, according to this method, would be 81 per cent. In the foreign seed laboratories fees are charged for testing and certifying to the quality of seeds. These are paid by the dealer and usually include a reëxamination free of charge to the planter if he is not satisfied with the seed when purchased. To protect the dealer a certain quantity of seed must be purchased, and other requirements are made to insure against substitution on the part of the consumer. In the United States, where little seed is sold under guaranty, the few laboratories do not make charges for inspection. Naturally seed that has been examined and certified to brings a higher price in the market, but sentiment in America seems still in favor of cheap seed regardless of the quality. For full descriptions of method, etc., see *United States Department of Agriculture, Yearbook* (Washington, 1895 et seq.), and *Office Experiment Stations, Circular 34* (revised, ib., 1906).

SEE'LAND. One of the Danish islands. See ZEALAND.

SEELEY, sē'lĭ, HARRY GOVIER (1839–1909). An English geologist and paleontologist, born in London and educated at the Royal School of Mines and then at Sidney Sussex College, Cambridge. He arranged the fossils in the Woodwardian Museum and in London became professor of geography in King's College (1876) and dean of Queen's College (1881). He was transferred to the chair of geology and mineralogy at King's College in 1896 and from 1891 to 1905 held also a like chair at the Royal Indian Engineering College. His paleontological researches include the discovery of skeletons of the *Pareiasaurus* and of the *Cynognathus*. His works include: *Ornithosauria* (1870); *Physical Geology and Palæontology* (1884); *The Fresh-Water Fishes of Europe* (1886); *Factors in Life* (1887); *Story of the Earth in Past Ages* (1895; 2d ed., 1902); *Dragons of the Air* (1901).

SEELEY, SIR JOHN ROBERT (1834–95). An English essayist and historian, born in London and educated at Christ's College, Cambridge. In 1863 he was appointed professor of Latin in University College, London, and in 1869 professor of modern history at Cambridge, a position which he retained till his death. His *Ecce Homo* (published anonymously in 1865), a plain account of Christ the man, excited great interest and called forth much discussion and many replies. It was supplemented by *Natural Religion* (1882). His contributions to history comprise *The Life and Times of Stein* (1878) and *The Expansion of England* (1883), a fine and impressive justification of Imperial England, which, at the instance of Lord Rosebery, brought him knighthood. His *The Growth of British Policy* was published posthumously in the year of his death. Consult the memoir by G. W. Prothero prefaced to that work.

SEELIGER, zā'lĭ-gēr, HUGO, KNIGHT VON (1849–). A German astronomer, born at Biala in Austrian Silesia and educated in Heidelberg and at Leipzig, where he became assistant in the observatory in 1871. In 1881 he was appointed director of the observatory at Gotha and in 1882 received a like position and a chair in the university at Munich. He wrote, among other works: *Zur theorie der Doppelsternbewegungen* (1872); *Untersuchungen über die Bewegungsverhältnisse in dem dreifachen Sternsysteme ζ Cancri* (1881; 2d series, 1888; 3d series, 1894); *Zur Theorie der Beleuchtung der grossen Planeten, insbesondere des Saturns* (1887); *Allgemeine Probleme der Mechanik des Himmels* (1892); *Ueber den Schatten eines Planeten* (1895); *Kosmische Staubmassen und das Zodiakallicht* (1901); *Die absolute Bewegung* (1906). Seeliger became editor of the *Neue Annalen der königlichen Sternwarte in München.*

SEE'LY, JOHN (EDWARD BERNARD) (1868–). An English politician, born in Nottinghamshire. He was educated at Trinity College, Cambridge, and in 1897 was called to the bar. He became a colonel of Hampshire Carabineers and served with the Imperial Yeomanry in South Africa in 1900–01. He was a Liberal member of Parliament in 1900–06 for the Isle of Wight, where his father owned much property; in 1906–10 for the Abercrombie division, Liverpool; and after 1910 for Ilkeston division, Derby. In 1908–10 he was Undersecretary of State for the Colonies and in 1911 for War and in 1912 became Secretary of State for War. He resigned at the end of March, 1914, because he had signed, without authority from the cabinet, an army-council minute which was construed to mean that army officers would not be required to serve against the Ulster opposition to Home Rule. At the same time Sir John French and Sir J. S. Ewart resigned from the army.

SEELYE, sē'lĭ, JULIUS HAWLEY (1824–95).

An American author and educator, brother of L. Clark Seelye, born at Bethel, Conn. He graduated at Amherst College in 1849 and studied theology at Auburn Theological Seminary and at the University of Halle, Germany, after which he returned to America and was pastor of the First Reformed Church at Schenectady, N. Y., from 1853 to 1858, when he was elected professor of mental and moral philosophy at Amherst College. In 1874 he was elected as a result of a nonpartisan movement a member of Congress, where, despite the fact that he was a Republican, he opposed the establishment of the Electoral Commission. From 1879 until 1890 he was president of Amherst College. His publications include: a translation of Schwegler's *History of Philosophy* (1856); *The Way, the Truth, the Life* (1873; trans. into Hindustani, Japanese, and German); *Christian Missions* (1875); a revised edition of Hickok's *Moral Science* (1880).

SEELYE, L(AURENUS) CLARK (1837–). An American college president, brother of Julius Hawley Seelye, born at Bethel, Conn. He was educated at Union College, at Andover Theological Seminary, and at the universities of Berlin and Heidelberg. From 1863 to 1865 he was pastor of the North Congregational Church of Springfield, Mass., and then served as professor of rhetoric and English literature at Amherst until 1873. In this year he was elected the first president of Smith College (q.v.), which he organized and developed, and whose policy and curriculum he largely determined. He became president emeritus in 1910.

SEEMANN, zā'män, BERTHOLD (1825–71). A German explorer and naturalist, born in Hanover. He was a member of the British expedition which sailed in the *Herald* and visited the West Indies, Central and South America, the Arctic, the Hawaiian Islands, and South Africa (1847–51). In 1852 he published *Narrative of the Voyage of the Herald* (Ger. trans., 1858). In 1860 he visited the Fiji Islands and from 1864 to 1866 explored Venezuela, the Isthmus of Panama, and Central America. Among his numerous publications both in English and in German are: *Die Volksnamen der amerikanischen Pflanzen* (1851); *Die in Europa eingeführten Akazien* (1852); *Popular History of the Palms* (1855; Ger. trans., 1857); *Viti, Account of a Government Mission to the Vitian or Figan Islands* (1862); *History of the Isthmus of Panama* (2d ed., 1867). In 1853 he founded the botanical periodical *Bonplandia*, which from 1864 to 1871 he continued in England as the *Journal of British and Foreign Botany*.

SEERESS OF PREVORST. See PREVORST.

SEFFNER, zĕf'nĕr, KARL (1861–). A German sculptor, born at Leipzig, where he studied at the academy under Melchior zur Strassen (1832–96). After a short apprenticeship in Berlin under Schuler and Hundrieser he worked in Italy (1885–88) and settled at Leipzig, where he won a reputation by his portrait busts and statues, full of animation and keenly characteristic. Besides the busts of Anton Springer, Karl Thiersch, and other scholars (1889–93; Leipzig University) there should be mentioned those of "King Albert and Queen Carola of Saxony" (Leipzig Museum), the busts of Wilhelm Scherer (Berlin University) and Max Klinger (Albertinum, Dresden), and the statue of King Friedrich August (Leipzig University). Of especial interest and merit are the monuments to Bach and Goethe (represented in his student years) at Leipzig.

SEGANTINI, sā'gän-tē'nē, GIOVANNI (1858–99). An Italian figure and landscape painter, born at Arco, south Tirol. His parents died when he was young, and he became a herdsman. Later he entered the Brera Academy at Milan, gaining his livelihood by painting signs and advertisements. His "Ave Maria" won the gold medal at Amsterdam in 1883. In 1882 he left Milan for the Brianza (near Como) and four years later sought the Swiss Alps, finally settling in the Engadine. His transcripts from the hard life of the peasant, e.g., "At the Tether" (National Gallery, Rome), "Plowing in the Engadine" (Munich Pinakothek), "Dark Hours" and "Return to the Old Home" (both in Berlin Gallery), show a monotonous, trivial life overwhelmed by the cold, hard majesty of nature. Segantini towers above other Italian painters of the nineteenth century by reason of his originality and power. An intense realist, he saw the hard facts of existence through no softening medium. The atmosphere of his pictures is keen and crystalline; the objects stand out in sharp relief. A picture, "Sorrow Finding Comfort in Faith" (1896; Hamburg Gallery), marks the later development of his art, when he sought for the expression of moral and mystical ideas. Of this type are: "Punishment of Luxury" (Walker Gallery, Liverpool), "Unnatural Mothers" (Vienna Gallery), and the "Angel of Life" (Budapest Gallery). Many of his works, including his great unfinished triptych of the "Alpine World," are in the Segantini Museum, St. Moritz. Consult the monographs by Villari (London, 1901), Servaes (Vienna, 1902), Montandon (Bielefeld, 1904), and Segantini (Munich, 1913).

SEGERS, sā'gĕrs, HERCULES PIETERSZ (c.1590–c.1640). A Dutch landscape painter and etcher. He was born in Haarlem and was early apprenticed to Gilles van Coninxloo at Amsterdam, where most of his life was passed. He also worked in Utrecht, in Haarlem, and at The Hague. Entirely unappreciated in his own day, he had to struggle continually with poverty and debt; only recently has he been recognized as one of the chief pioneers of modern landscape painting and forerunner of the most modern color etchers. His colored, printed, stipple leaves, which now bring very high prices, show faithful study of nature, poetic and rather melancholy imagination, artistic arrangement, rich detail, and harmonious effect. His motives are varied and original and indicate that he traveled in Italy and Switzerland, Alpine scenery being a favorite subject. His simple and vigorous technique is akin to that of the German Little Masters. He etched about 60 leaves, 50 of which are in the Cabinet at Amsterdam. Examples are also in the print rooms of the British Museum, the Dresden and Berlin galleries, and the Albertina, Vienna. His painted landscapes, until recently ascribed to other masters, have the same distinctive character. Preëminently a tone painter, he excels in rendering delicate atmospheric effects. His masterpiece is a mountain landscape, in the Uffizi, Florence, formerly ascribed to Rembrandt. A "Desolate High Valley," another so-called Rembrandt, in the Edinburgh Gallery, is attributed to Segers by Bode, and there is a signed Dutch landscape and another picture attributed to him in the Berlin Gallery. Segers influenced Rem-

brandt to take up landscape painting. Consult Wilhelm Bode, *Great Masters of Dutch and Flemish Painting* (London, 1909).

SEGES'TA (Lat., from Gk. Ἔγεστα, *Egesta*, Αἴγεστα, *Aigesta*. See below). An ancient city in northwestern Sicily, about 6 miles from its seaport, near the modern Castellamare. The town belonged to the Elymi, a tribe whom the Greek colonists found in the extreme west of the island and whose ethnology is uncertain. Later tradition attributed the foundation to a band of fugitives from Troy, and in Roman times this tale was connected with the story of the wanderings of Æneas (q.v.). The coins seem to indicate some truth in the tradition of a Phocæan (less probably Phocian) element in the population. The place was reckoned among the non-Hellenic cities and was engaged in frequent strife with its Dorian neighbor, Selinus (q.v.). In the fifth century B.C. it sought Athenian support and in 415 B.C. brought about the disastrous attack on Syracuse (q.v.); one of the alleged objects of that expedition was to help Segesta against Selinus (q.v.). In 409 B.C. Segesta turned to Carthage for help, and thus led to the destruction of Selinus and the renewal of the long war between the Carthaginians and the Greeks. It was besieged unsuccessfully by the elder Dionysius, but later must have left the Carthaginians, for it is called an ally of Agathocles (q.v.) in 306 B.C. On his return from Africa that tyrant demanded a huge contribution and, when refused, charged the city with conspiracy and massacred with tortures a great part of the inhabitants. From that time the town seems to have lost its importance, though it was especially favored by the Romans. The Romans changed the name of the city from Egesta, which suggested Lat. *egestas*, absolute want, to Segesta. During the Saracenic wars the site was abandoned and is now marked only by a picturesque and well-preserved though unfinished Doric temple and a fine rock-cut theatre of great size. Excavations have also brought to light a few remains of private houses. Consult E. A. Freeman, *The History of Sicily from the Earliest Times*, vol. iii (Oxford, 1892), and K. Baedeker, *Southern Italy and Sicily* (16th Eng. ed., Leipzig, 1912).

SEGESTES, sē-jĕs'tēz *or* sā-gĕs'tās. A German chieftain. See GERMANICUS CÆSAR.

SEGESVÁR, shĕ'gĕsh-vär. An Hungarian city. See SCHÄSSBURG.

SEGHERS, sā'gĕrs, or **ZEGERS,** DANIEL (1590–1661). A renowned Flemish flower painter, born at Antwerp, where he studied under Jan Brueghel, entered the guild in 1611, and in 1614 joined the Order of the Jesuits. His pictures were in great demand, and he received numerous commissions from royalty, including one to decorate a room in the House-in-the-Woods, near The Hague, for Amelia of Solms. He frequently painted in collaboration with historical and landscape painters, surrounding their subjects, most generally the Madonna, with a garland. In this way he coöperated with Rubens, Schut, Diepenbeeck, Quellinus, and Brouwer. His flowers are treated decoratively; his color, thinly laid on, is cold and clear. Specimens of his art may be seen in nearly all the public galleries of Europe.

SEGMENT (Lat. *segmentum*, piece cut off, from *secare*, to cut; connected with OHG. *saga*, *sega*, Ger. *Säge*, AS. *saga*, Eng. *saw*). In geometry, a portion of a line, or a portion of a circle or of a sphere cut off by a secant line or plane. A segment of a circle is called a circular segment, and a segment of a sphere is called a spherical segment. If the secant of a circle or sphere is a diameter of the circle or a diametral plane of the sphere, the segments are equal and are semicircles or hemispheres respectively; otherwise they are unequal, and the lesser one is called the minor and the greater the major segment. The area of a circular segment in a circle of radius r, whose chord subtends a central angle θ, is $\frac{r^2(\theta - \sin\theta)}{2}$, θ being measured in radians. For the volume of a spherical segment, see MENSURATION.

SEGNERI, sân-yā'rĕ, PAOLO (1624–94). An Italian Jesuit mission preacher. He was born at Nettuno, educated by the Jesuits of Rome, and joined the Society in 1637. As a preacher he appealed to the emotional southern temperament by a dramatic manner. But his sermons had intellectual qualities which justified his selection by Pope Innocent XII as a preacher at the papal court. There is an edition of his sermons and other works in Italian (Milan, 1845–47), and his famous *Lenten Sermons*, *Panegyrics*, *Manna of the Soul*, and *Practice of Interior Recollection with God* have all been translated into English and published in London (1872–81). Consult his *Life* (London, 1851) and his *Sermons from the Quaresimale* (ed. by Ford, London, 1869).

SE'GO. A fortified post of French West Africa. See SEGU SIKORO.

SEG'ODU'NUM. See RODEZ.

SE'GO LILY. See CALOCHORTUS.

SEGOND-WEBER, sə-gôN'-vā'bâr', EUGÉNIE CAROLINE (1867–). A French tragic actress, born at Paris. She studied at the Conservatory, where she won the first prize in tragedy. She played at the Odéon and first appeared at the Comédie Française in 1887, in the rôle of Doña Sol in Hugo's *Hernani*. Her greatest successes were in Corneille's *Le Cid*, *Polyeucte*, and *Rodogune*, in Racine's *Andromaque*, and in such plays as *France d'abord*, *La maison d'Argile*, and *Les Erynnies*. She became a *sociétaire* of the Comédie Française in 1902.

SEGOVIA, sā-gō'vē-ä, or WANKS. A river forming in the lower half of its course the boundary between Honduras and Nicaragua (Map: Central America, E 3). It rises in the mountains near the Gulf of Fonseca and flows northeast in a course of 400 miles, emptying into the Caribbean Sea at Cape Gracias á Dios. It is navigable for small river craft 170 miles from its delta, being then obstructed by rapids. The channels of the delta, however, are very shallow, and the coast lagoon into which they discharge is silting up.

SEGOVIA. The capital of the Province of Segovia in Old Castile, Spain. It is situated on the north slope of the Sierra de Guadarrama, 40 miles northwest of Madrid (Map: Spain, C 2). The old part of the town is built on an oblong, rocky hill with nearly precipitous sides, 330 feet high. It is surrounded by a wall with 86 towers, running along the brink of the hill and, though dating from the eleventh and the twelfth centuries, in a good state of preservation. The northwest corner of the hill is a narrow, precipitous promontory between the river Eresma and a small tributary, and on this is perched the famous Alcázar, an imposing castle built in

the fourteenth century, where Isabella of Castile was crowned in 1474. It has two large towers crowned with bartizans and formed an important part of the fortifications. Noteworthy are the numerous churches. Including the old deserted monasteries, there are no less than 73 ecclesiastical buildings in this little town, and some of them, such as the cathedral, rank among the finest in Spain. The cathedral is a large Gothic basilica, begun in 1525, with two rows of chapels, flying buttresses, and a square tower, 345 feet high, crowned by a cupola. The San Estéban has a high Byzantine tower. The Roman aqueduct, built in the time of the Emperor Trajan (c.100 A.D.), is the largest Roman monument extant in Spain. It crosses the valley between the mountains and the town on a double tier of arches, some of which are 94 feet high. There are paper and flour mills, iron and lead foundries, and dyeing establishments. Pop., 1900, 14,658; 1910, 14,910.

SEGRE, sā'grā, CORRADO (1863–). An Italian mathematician, born at Saluzzo. He became professor of higher geometry at the University of Turin. A member of the Reale Accademia dei Lincei and of the Reale Accademia delle Scienze, he made contributions to the *Rivista Italiana di Filosofia* and to *La Rassegna Nazionale.* Segre is author of *Le geometrie projettive nei campi di numeri duali* (1912).

SEGRETO DI SUSANNA, sā-grā'tô dē sōō-zän'nä, (SUSANNENS GEHEIMNISS). An opera by Wolf-Ferrari (q.v.), first produced in Munich, Dec. 4, 1909; in the United States, March 14, 1911 (New York).

SEGUIDILLA, sā'gē-dē'lyä (Sp., little sequence, dim of *seguida,* succession, from *seguir,* from Lat. *sequi,* to follow). A national Spanish dance in $\frac{3}{4}$ time. Its characteristic is the rhythmic figure

which is played on castanets for four bars as an introduction. After every movement it is repeated for four bars. The music is usually played on a guitar with castanet accompaniment, and during the dance the musicians also sing. The seguidilla is danced by several couples, who arrange themselves in two parallel lines. After nine bars of music the dancers slowly change places, dance again, and return to their original positions. The third part of the seguidilla is suddenly interrupted on the ninth bar, and the dancers remain motionless for a second in the exact postures held by them at the time.

SÉGUIER, sā'gyā', PIERRE (1588–1672). A French official, born in Paris. He was first a clerk in the Parlement of Paris and was advanced steadily till he became *président à mortier* of the Parlement (1624–33), an office in which he showed himself a zealous defender of the claims of the Parlement against the monarchy. Richelieu made him Keeper of the Seals, and in 1635 he became Chancellor of France, serving as such under Richelieu, Mazarin, and Louis XIV. Séguier was not exactly an independent political force, but rather a high-grade official. Richelieu sent him to seize the papers of Anne of Austria (1637) and gave him the tasks of repressing the revolt in Normandy (1639) and prosecuting Cinq-Mars and De Thou (1642). The leaders of the parliamentary Fronde brought about his dismissal in 1650, but he regained his high office in 1656 and lived to serve under Colbert. A learned patron of literature and the arts, Séguier succeeded Richelieu as protector of the French Academy and Mazarin as protector of the Academy of Painting and Sculpture. His library, to which he made constant additions, contained many valuable manuscripts, which are now for the most part in the Bibliothèque Nationale. Consult: François Duchesne, *Histoire des chanceliers des sceaux de France* (Paris, 1680); *Catalogue de documents historiques . . . relatifs au règne de Louis XIII* (ib., 1847); R. P. Kerviler, *Le chancelier Pierre Séguier* (ib., 1874).

SEGUIN, sē-gēn'. A city and the county seat of Guadalupe Co., Tex., 35 miles northeast of San Antonio, on the Guadalupe River, and on the Galveston, Harrisburg, and San Antonio Railroad (Map: Texas, D 5). It is the seat of a Lutheran college. There are flour, oil, and planing mills, cotton gins, and brickworks. Pop., 1900, 2421; 1910, 3116.

SEGUIN, sā'găN', EDOUARD ONESIMUS (1812–80). A French-American alienist and educator, father of E. C. Seguin. He was born at Clamecy, Nièvre, France, and was educated in Paris at the colleges of Auxerre and Saint-Louis. He studied medicine and surgery under J. G. Itard, at whose suggestion he devoted his life to the treatment of idiots. In this field he gained international recognition. After the revolution of 1848 Seguin came to the United States, where, while also practicing medicine, he gave much time to schools for idiot children, in Massachusetts, New York, Connecticut, and Ohio. Seguin also made a careful study of thermometry and invented a widely used clinical thermometer. He was resident at various times at Cleveland and Portsmouth, Ohio, and Mount Vernon, N. Y. In 1863 he settled in New York City, where in 1879 he established the Seguin Physiological School for Feeble-Minded Children. After his death this institution was conducted by his wife at Orange, N. J. A renewed interest has been imparted to Seguin's work, first, by the increasing attention given to the education of idiots and of feeble-minded children and, secondly, by the widespread interest in the work of Maria Montessori (q.v.), who bears testimony to the influence of Seguin's writings on her own ideas. His writings, in English, include: *Historical Notice of the Origin and Progress of the Treatment of Idiots* (trans. by Newberry, 1852); *Idiocy and its Treatment by the Physiological Method* (1886; later eds.); *Wunderlich's Medical Thermometry* (1871), with additions. Consult H. Holman, *Seguin and his Physiological Method of Education* (London, 1914). See IDIOCY.

SEGUIN, sē-gwĭn', EDWARD CONSTANT (1843–98). An American neurologist. He was born in Paris, France, the son of Edouard O. Seguin, with whom he came to the United States. He attended the College of Physicians and Surgeons (New York City), where, after a year (1869–70) in Paris under Brown-Séquard, Charcot, Cornil, and Ranvier, he was lecturer and later professor and where he founded the clinic for nervous diseases (1873). Seguin was a founder of the New York Neurological Society and of the American Neurological Association. He added much to the knowledge of medication in nerve diseases. His greatest achieve-

ment in therapeusis is probably his advocacy and introduction of very large doses of the iodides, called the American method. To him we owe most of our knowledge of the use of aconitia and of a large increase in the understanding of hyoscyamus, as well as of arsenic in its application in chorea. He was the editor of *The American Series of Clinical Lectures*. His collected essays appeared as *Opera Minora* in 1884.

SÉGUR, sā′gŭr′. A noble French family of Guienne.—Philippe Henri, Marquis de Ségur-Ponchat (1724–1801), served in the wars of Louis XV and under Louis XVI was Minister of War.—Louis Philippe, Count Ségur d'Agesseau (1753–1830), was born in Paris. He was one of the French officers under Rochambeau in the American Revolution. In 1783 he was sent as French Ambassador to Russia and became a great favorite of Catharine II. His public career during the Empire was respectable, but not brilliant. He left many works, among which are: *La politique de tous les cabinets de l'Europe* (1793); *Tableau historique et politique de l'Europe de 1786–1796* (1800); *Histoire universelle* (1817); *Mémoires* (1825–26).—His son, Philippe Paul, Count de Ségur (1780–1873), was a general of the First Empire. He participated in various campaigns of Napoleon and during the Russian campaign of 1812 was general of brigade. At the First Restoration he was given command of the cavalry, but after the Second Restoration withdrew into private life until after the July revolution. In 1831 he was made lieutenant general and raised to the peerage. He wrote: *Lettre sur la campagne du général Macdonald dans les Grisons* (1802); the valuable *Histoire de Napoléon et la grande armée pendant l'année 1812* (1824); *Histoire de Russie et de Pierre le Grand* (1829); *Histoire de Charles VIII, roi de France* (1834).

SÉGUR, Joseph Alexandre, Vicomte de (1756–1805). A French writer of comedy and libretto. He was born in Paris, was brought up for the army, and was deputy of the nobility in the States-General of 1789, but was ruined by the Revolution and was compelled to make a living by literary work. Several political brochures were followed by the *Correspondance secrète de Ninon de L'Enclos* (1790), which brought the author immediate popularity. *La femme jalouse* and *Le retour du mari* appeared soon after. Ségur wrote the French words for Haydn's *Creation*, produced at the Opéra. He published in 1795 an interesting account of his imprisonment during the Revolution: *Ma prison depuis le 23 vendémiaire jusqu'au 10 thermidor*. His last work, published in 1803 and very popular at the time, was entitled *Les femmes, leurs cœurs, leurs passions, leur influence, et leur condition dans l'ordre moral*. His *Œuvres diverses* were published in 1819.

SEGURA, sā-gōō′rä. A river of southeast Spain. It rises in the Sierra de Segura, in the Province of Jaén, and after an east-southeasterly course of about 150 miles enters the Mediterranean 19 miles southwest of Alicante (Map: Spain, E 3). The Segura supplies water to several canals in the Province of Alicante, is extensively used for irrigation, but is navigable only for small boats even at its mouth.

SE'GU SIK'ORO, or Sego. A fortified post on the right bank of the Niger in the interior of French West Africa, about 670 miles east-southeast of Saint-Louis (Map: Africa, D 3). It consists practically of a group of villages stretching along the Niger and containing a population of about 36,000, but the actual town is considered as possessing 6550 inhabitants.

SEHARUNPOOR, sē-hăr′ŭn-pōōr′. A town of India. See Saharanpur.

SEIDEL, sī′dĕl, Emil (1864–). An American Socialist leader, born at Ashland, Pa. He learned wood carving in Germany in 1885–93 and was an assistant in the German exhibit at the Chicago Exposition in 1893. At Milwaukee, Wis., he was one of the organizers of the Wood Carvers' Union and one of the founders of the Socialist party organization there. In 1902 he was Socialist candidate for Governor of Wisconsin. He served as a Milwaukee alderman from 1904 to 1909. In 1910 the Socialists dislodged the corrupt city government that had long been in control and elected Seidel mayor—the first Socialist mayor of any important American city. He proceeded to carry out several important reforms. At the end of his first term (1912) he was defeated for reëlection by the fusion of other parties and by corporate interests. The same year he was also the candidate of the Socialist party for Vice President of the United States and in 1914 was again nominated for mayor, but was defeated.

SEIDL, zī′d'l, Anton (1850–98). A musical conductor, born in Pest. He was educated at the Leipzig Conservatory and upon graduation became chorus master at the Vienna Opera. Hans Richter introduced him to Wagner, who engaged him to assist in preparing the Nibelung Trilogy, upon which work he was engaged until 1875. Upon Wagner's recommendation Angelo Neumann engaged him as conductor of the itinerant series of Wagner operas (1879–83). In 1885 Seidl accepted an engagement in New York as conductor of the German opera. There he soon developed the concert orchestra popularly known as the Seidl Orchestra. In 1892 the German opera was temporarily discontinued, but he again served as conductor during the New York seasons of 1895–96 and in 1897. In addition he was the conductor of the Philharmonic Society and of the Sunday-night concerts. In 1897 he was engaged as one of the conductors at Covent Garden, London. In 1886 and 1897 he was one of the conductors at the Bayreuth Festival. He died in New York. Consult H. E. Krehbiel, *Anton Seidl* (New York, 1898).

SEIDL, Johann Gabriel (1804–75). An Austrian poet, born in Vienna. He studied law and was called in 1840 to Vienna as custodian of the cabinet of coins and antiques in the museum; from 1850 to his death he was editor of the *Zeitschrift für österreichische Gymnasien;* and he held various government offices. He devoted his leisure to literature and became especially well known for his lyric and dialect poetry. His publications in this department include: *Dichtungen* (1826–28); *Gedichte in niederösterreichischer Mundart* (1844; 4 eds.); *Bifolien* (1855; 5 eds.); *Natur und Herz* (1859; 3 eds.). Seidl is the author of the Austrian national hymn (1854) set to Haydn's music.

SEIDLITZ (sĕd′lĭts) **POWDERS** (named from the mineral spring of Seidlitz, or Sedlitz, in Bohemian Austria). Powders composed of 120 grains of tartrate of soda and potash and 40 grains of bicarbonate of soda reduced to powder, mixed and inclosed in a blue paper, and

35 grains of powdered tartaric acid in a white paper. The contents of the blue paper are dissolved in half a tumbler of water, and those of the white in half a tumbler of water, and the two are poured together. The mixture should be taken while the effervescence from the liberation of the carbonic acid is still going on. These powders act as an agreeable and mild cooling aperient. They are also called Rochelle powders.

SEIGNELAY, sâ'nye-lâ', MARQUIS DE. See COLBERT, J. B.

SEIGNIORAGE, sēn'yĕr-âj (ML. *seniorati-cum*, lordship, dominion, from Lat. *senior*, elder, lord, comp. of *senex*, old; connected with Gk. *ἕνος, henos*). The excess of the nominal value of a coin over its bullion value at the moment of coining. Such excess may represent only the cost of coinage, for which the term "brassage," used by French writers, has been proposed but not generally adopted, or it may represent a profit to the state. Where free coinage exists any mint charge or seigniorage will act as a check upon the readiness with which private persons bring bullion to the mint for coinage. On the other hand, such a seigniorage offers an inducement to the state to coin money freely. If it yields to the temptation, it may gain an immediate advantage, but not without jeoparding the security of its currency and running the risk of depreciating the value of its issues. Monetary legislation authorizing underweight coins usually limits the amount of such issues. See COINAGE; MINT; MONEY.

SEIGNIORY, sēn'yĕr-ĭ (ML. *senioria*, from Lat. *senior*, elder, lord). The domain of a seignior or feudal lord and, in the strict sense, the ultimate unit in the feudal system. It was a local fragment of sovereignty annexed to property in land. The beginnings of the seigniory are to be found in the late Roman Empire in the authority (*patrocinium*) which the great provincial magnates (*potentes*) exercised over the common people, especially the tillers of the soil. Among the German tribes which overthrew the West Roman Empire the germs of similar relations existed. The German noble had rights of protection (which implied control) over free followers, servants, and tenants who voluntarily commended themselves to him and became his men. In the Frankish Empire these Roman and German institutions were fused into the seniorate, and the powers of the senior were enlarged and consolidated by the development of the immunity. Immunity, another institution which dates from the late Roman Empire and which originally meant exemption from taxes and the baser services, was ultimately granted in the Carolingian period to all who held royal land as a benefice or fief, and it came to include much of the power of local government. The grant of immunity excluded the regular officers of the Empire (the counts) from entry (*introitus*) into the immune district; it devolved upon the seignior the right and duty of raising and leading the armed forces of the district, of preserving the peace, and collecting fines from those who broke it; and it gave him jurisdiction in all minor cases (*causæ minores*) over his followers, servants, and tenants. In criminal cases and in cases involving status the county court was still exclusively competent; but when one of the seignior's men was charged with a criminal offense it was customary to appeal first of all to the seignior, and if the complainant was satisfied by the seignior the case went no further. Thus there was developed in the seigniory a seigniorial or manorial court, in which the seignior's *advocatus* (*vogt*) or bailiff presided and in which (usually) judgments were approved by the tenants. After the overthrow of the Frankish Empire the seigniors became petty monarchs of their seigniories, exercising nearly all the powers of the state. In the open country the free and previously independent inhabitants of the seigniory were forced into subjection and for the most part reduced to serfdom. In the towns, on the contrary, the authority of the seigniors was gradually extinguished and all the townsmen became free.

Towards the close of the Middle Ages, in consequence of the increase of royal power, the authority of the seigniors was gradually restricted. The military and taxing powers of the crown were exercised directly within the seigniories. The rights which the seigniors retained were economic rather than political; the political powers which they held longest were those of local police. These remnants of seigniorial authority were swept away by revolution or extinguished by legislation in the eighteenth and nineteenth centuries. Consult authorities referred to under FEUDALISM.

SEIGNOBOS, sâ'nyō'bō', CHARLES (1854–). A French historian and publicist. He was educated in the lycée of Tournon and at the Ecole Normale Supérieure, Paris, and was professor at Lyons and later professor in the Faculty of Letters, Paris. His important writings include: *Histoire de la civilisation* (1886; 10th ed., 1911; Eng. trans., 1906); *Histoire des peuples de l'Orient et de la Grèce* (1890); *Histoire politique de l'Europe contemporaine, 1814–1896* (1897; Eng. trans., 1902); *Introduction aux études historiques* (1897); *La méthode historique appliquée aux sciences sociales* (1901); *Cours d'histoire* (9 vols., 1903–06); *Histoire moderne* (1911); *Histoire ancienne* (1911).

SEINE, sān. One of the principal rivers of France. It rises on the Plateau of Langres in the Department of Côte-d'Or and flows in a general northwest course of 472 miles, passing through the city of Paris and emptying into the English Channel through a wide estuary at Havre (Map: France, N., G 3). It falls very rapidly in its upper course, but below Paris its current becomes slow and its course is noted for its many incised meanders. Its principal tributaries are the Marne and the Oise, both joining it from the north near Paris. The Seine is the most important commercial waterway of France, and considerable engineering works have been undertaken to facilitate its navigation, including a number of locks between Paris and Rouen. The river is navigable 337 miles to Méry, but from Marcilly, a little below Méry, a lateral canal follows its course to Troyes. The Seine is subject to great floods; the last occurred during January, 1910, when the water stood over 24 feet above the normal at Paris. Along the north shore of the estuary a ship canal 14 miles long leads from Tancarville into the harbor of Havre, while other canals connect the river through its tributaries with the Loire, the Rhone, the Rhine, the Meuse, and the Scheldt. The water-borne traffic for the city of Paris amounted in 1910 to

10,330,758 tons. Consult Lavoinne, *La Seine maritime et son estuaire* (Paris, 1885), and Barron, *La Seine* (ib., 1889).

SEINE. The metropolitan department of France surrounded by the Department of Seine-et-Oise and comprising the arrondissements of Paris, Saint-Denis, and Sceaux (Map: France, N., H 4). It is at once the smallest and the most populous department in the Republic. Its area is 185 square miles. Pop., 1911, 4,154,042.

SEINE-ET-MARNE, -ā-märn. An inland department of north France (Map: France, N., H 4). Area, 2290 square miles. Pop., 1911, 363,561. The department derives its name from the two chief streams that water it, the Seine flowing through the southern and the Marne through the northern part. There are no mountains. Timber is grown in every part, and among the forests is that of Fontainebleau. The soil is generally fertile. Wheat is the principal cereal. Paving stone is quarried at Fontainebleau, and there are manufactures of flour and sugar. Capital, Melun.

SEINE-ET-OISE, -ā-wäz. A department of north France, surrounding the metropolitan Department of Seine (q.v.) (Map: France, N., G 4). Area, 2184 square miles. Pop., 1911, 817,617. The chief rivers are the Seine and the Oise, which have numerous affluents. Oats is the principal cereal, and wheat, sugar beets, forage roots, cider apples, and vegetables are important. The industries include silk, wool, and flax spinning, hosiery making, flour milling, sugar refining, and the manufacture of iron and copper articles. There are several fine varieties of stone and clays. Porcelain is largely made at the famous Sèvres (q.v.) factories. Capital, Versailles.

SEINE-INFÉRIEURE, -ăN'fâ'rē-ēr'. A maritime department of north France (Map: France, N., F 3). Area, 2448 square miles. Pop., 1911, 877,383. The Seine flows through the southern districts, and a number of important though small streams flow northwest across the department. Wheat, oats, sugar beets, colza, and cider apples are cultivated, and some cheese is made. There are cotton, wool, and flax manufactures; iron, copper, locomotive, and machinery works are among the industrial establishments. Capital, Rouen.

SE'IR (Heb. *Sē'ir*). A synonym for the land of Edom (e.g., Gen. xxxii. 3), and especially the name of the Edomite mountain land, Mount Seir (e.g., Deut. ii. 1). It is disputed whether the name is applied only to the mountains or also to the region west of the Arabah (q.v.). In the patriarchal tradition Esau, ancestor of the Edomites, is etymologically connected with Seir, he being described as a man "of hair" (*sē'ăr*, Gen. xxv. 25; xxvii. 11). But in Gen. xxxvi. 20 et seq. Seir is the ancestor of the Horites (q.v.), the aboriginal inhabitants. In a papyrus of Rameses III (c.1200–1169 B.C.) the Seirites are mentioned as a Bedouin tribe. The name is therefore ancient and its etymology uncertain, whether it is to be derived from the people or from the land. In the latter case just as Edom (red) describes the prevailing color of these mountains, so Seir (hairy, shaggy, or, perhaps, awful) may express the roughness of the country. This great mountain ridge, composed of argillaceous rock, porphyry, and sandstone, extends from the Dead Sea to the Gulf of Akabah on the Red Sea. It presents a precipitous front to the west and is broken by deep valleys, but the vegetation is rich and allows cultivation. Its most famous peak is Mount Hor, reputed scene of the death of Aaron, and its chief city the famous Petra (q.v.), in the neighborhood of which are to be seen some of the most remarkable and beautiful rock formations in the world. The mountains were the home of a hardy race, which enriched itself through its command of the trade routes from Arabia to the Mediterranean and which later spread north into Palestine. Consult: Edward Robinson, *Biblical Researches*, vol. ii (Boston, 1841–43); Brünnow and Domaszewski, *Provincia Arabia I* (Leipzig, 1904); Libbey and Hoskins, *Jordan Valley and Petra* (New York, 1905); A. Musil, *Arabia Petræa*, vol. ii (Vienna, 1907).

SEISES, Los. See Los Seises.

SEISIN, sē'zĭn (OF. *seisine, saizine, saisine*, Fr. *saisine*, from OF. *seizir, saizir*, Fr. *saisir*, to seize, probably connected with Eng. *set*, to place). Actual possession of land by a person entitled to it or claiming to have a freehold interest therein. This is sometimes spoken of as seisin in deed, as distinguished from seisin in law, which is a mere right of present possession. By the old common law seisin denoted the completion of feudal investiture of a tenant, accompanied by the rites of homage and fealty, after which he had the elements of a feudal title —possession as of the freehold. This was accomplished by a formal ceremony on the land, known as livery of seisin (q.v.). In most of the United States delivery of a deed is equivalent to livery of seisin and no formal entry on the land is necessary. However, the term "seisin" is still retained in American law, but there is confusion as to its technical meaning, the courts in some States using it as synonymous with actual possession and others in the sense of ownership. Consult Sir William Blackstone, *Commentaries* (4th ed., 2 vols., Chicago, 1899). See Disseisin; Possession; Real Property.

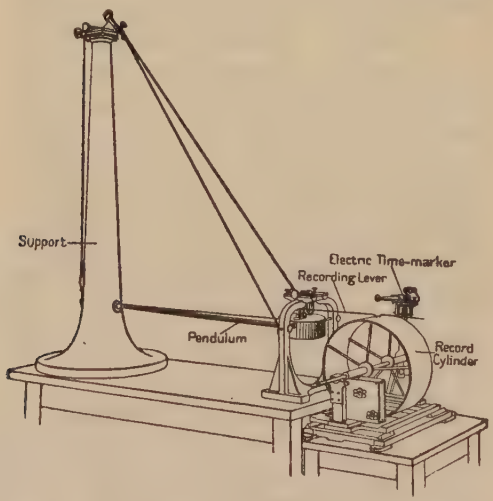
SEISIN, Livery of. See Livery of Seisin.

SEISMOGRAPH, sīs'mō-gråf (from Gk. σεισμός, *seismos*, earthquake + γράφειν, *graphein*, to write), Seismometer, or Seismoscope. Names given to instruments designed to indicate and record an earthquake shock. The name "seismoscope" is properly applied to instruments that show that earthquake motion has occurred and indicate also, perhaps, the time, but do not produce detailed records. The seismometer, or seismograph, on the other hand, records the time of occurrence, the period and amplitude of the vibratory motions of the ground or pier upon which the instrument is mounted, and all the characteristic phases earthquake motions possess.

The essential element of nearly all modern seismographs consists of a pendulum or its equivalent of very long period (10 to 20 seconds). The bobs, or steady masses as they are called, employed in such pendulous devices are sometimes very heavy, and by the manner and delicacy of their suspension they remain nearly at rest during the vibratory motion of the ground resulting from an earthquake. A record can therefore be made of this motion relative to such a steady mass. In some seismographs a vertical pendulum is employed; such the Italian observers have used for many years. In others the pendulum is of the horizontal type invented by Hengler in 1832, subsequently improved and adapted to scientific use by Professor Zöllner of Leipzig. This type of pendu-

lum was first successfully employed for recording earthquake motions by Ewing at Tokyo, Japan, about 1881. In some seismographs the record is produced photographically upon a moving strip of suitably sensitized paper or film; in others a delicate point or stylus traces the record upon smoked paper carried on a revolving cylinder.

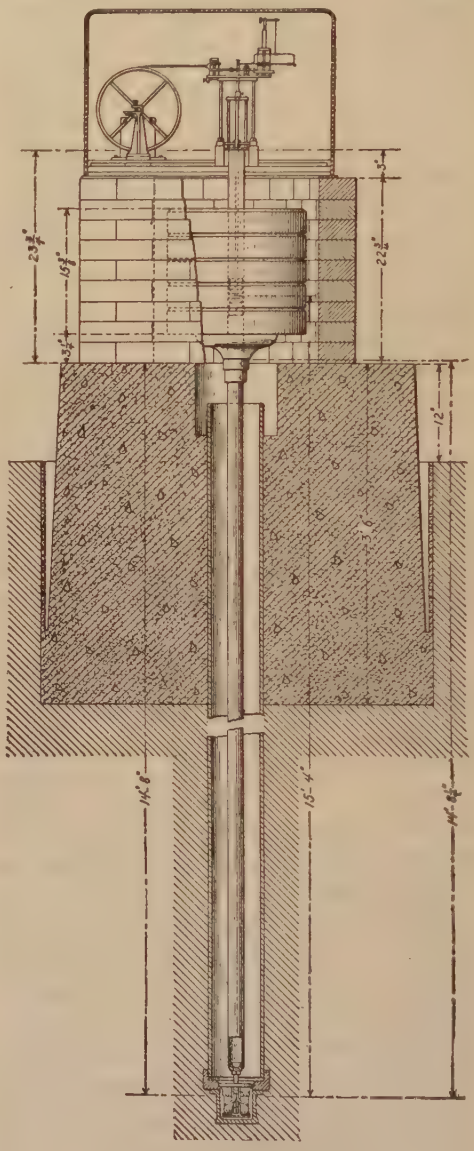
A simple horizontal pendulum seismograph which is now extensively used was devised by Prof. John Milne of England. This instrument consists of a horizontal pendulum which carries a boom at whose extremity there is an aluminium plate in which there is a transverse slit. This slit is placed below and at right angles to a second slit beneath which there is a moving band of bromide paper. Light from a lamp is reflected through the intersection of these two slits in the form of a point, when the two slits are in their position of rest, and makes a straight line on the moving paper. If there is any movement of the earth, there is a movement of one slit with respect to the other, causing a wavy line to be produced which indicates the tremors observed at the particular station. A clockwork arrangement opens and closes a shutter at regular intervals so that the light from the lamp makes a record of the time on the moving strip. Professor Milne in his observatory on the Isle of Wight, using such an instrument, was able to detect disturbances in Japan, Borneo, South America, or elsewhere,



OMORI SEISMOGRAPH OF UNITED STATES WEATHER BUREAU.

and the seismograms thus obtained, taken in connection with telegraphic information and interchange of observations at other stations, enabled the velocity, wave movement, source, and other features of an earthquake to be studied.

In certain modern seismographs an inverted pendulum is employed. This consists of a heavy mass at the top of a vertical strut or rod supported upon a pivot point or a knife edge at the bottom end. The point support gives freedom of motion in all directions in the horizontal, the knife edge or its equivalent restricts the freedom of motion to one direction or azimuth. A steady mass thus supported is unstable, but for the purposes of a seismograph it can be rendered stable by the application of appropriate springs whose elastic reaction just neutralizes the overturning tendency of gravity and by a slight excess of reaction or force permits the mass when slightly displaced to oscillate with a slow period. Wiechert has successfully employed such pendulums, and Marvin also employs this type of pendulum in the seismographs used by the United States Weather



MARVIN INVERTED PENDULUM SEISMOGRAPH.

Bureau. A recent form has been developed which possesses distinct advantages over any other forms thus far employed. The earlier seismograph, designed by Marvin in 1906 and 1907 and used at the Weather Bureau since 1907, was described and illustrated in detail in the *Monthly Weather Review*, vol. xxxv (Washington, November, 1907); a few minor improvements have been made since its original installation. The accompanying cut illustrates the essential inverted pendulum and its point of support.

Consult also: John Milne, *Earthquakes and Other Earth Movements* (New York, 1886); August Sieberg, *Handbuch der Erdbebenkunde* (Brunswick, 1904); C. E. Dutton, *Earthquakes in the Light of the New Seismology* (New York, 1907); C. G. Knott, *The Physics of Earthquake Phenomena* (Oxford, 1908); John Milne, *Seismology*, in "International Scientific Series," vol. lxxxv (2d rev. ed., London, 1908); miscellaneous papers on seismology in *Nature* (London); reports of the Committee on Seismological Investigations of the British Associations; the *Seismological Journal of Japan* (Tokyo, monthly). See EARTHQUAKE.

SEISMOLOGY, sīs-mŏl'ō-jĭ. See EARTHQUAKE.

SEISS, sēs, JOSEPH AUGUSTUS (1823–1904). An American Lutheran clergyman. He was born at Graceham, Md., and studied for two years at Pennsylvania College, Gettysburg. After a course of private instruction in theology he held several pastorates until 1874, when he built and inaugurated the church of the Holy Communion in Philadelphia. For 12 years he was editor of the *Lutheran* and for a time an editor of the *Prophetic Times*, also a founder of the General Council of the Church. Among his numerous writings are: *Baptist System Examined* (1854; 3d ed., 1882); *Last Times* (1856; 7th ed., 1880); *Ecclesia Lutherana* (1867); *Lectures on the Gospels* (1876); *Luther and the Reformation* (1883); *Lectures on the Epistles* (2 vols., 1885); *The Christ and his Church* (1902); *Recent Sermons* (1904).

SEISTAN, sås-tän', or **SISTAN.** A region in east Persia and southwest Afghanistan, between lat. 30° and 31° 35′ N., and long. 60° and 62° 40′ E. (Map: Persia, J 7). The Persian-Afghan boundary was determined in 1870–72 by an English boundary commission, which gave Sistan proper (mostly west of the Helmund) to Persia, and outer Sistan (to the east and southeast of Sistan proper) to Afghanistan. The Persian district is mostly sandy, but well watered and productive. A lake of variable dimensions supports the larger part of the inhabitants. Outer Sistan is only sparsely inhabited. The inhabitants are Persians and Baluchis. The region abounds in relics of antiquity and before the ravages of Tamerlane, in the fourteenth century, was one of the most important of the Persian provinces. Consult writings of Ellsworth Huntington, especially "The Depression of Sistan in Eastern Persia," in *American Geographical Society, Bulletin* (New York, May, 1905).

SEITZ, zīts, ANTON (1829–1900). A German genre painter, born at Roth-am-Sand, near Nuremberg. He studied under Wagner and Reindel in Nuremberg and under Flüggen in Munich and was especially successful with interior scenes on miniature scale, remarkable for delicate elaboration of the figures, fine chiaroscuro, and subtle humor, which earned him the name of the Munich Meissonier. A partial list of his principal works includes: "The Miser" (1860); "Dice-Players in a Tavern" (1862); "Rural Letter-Writer" (Germanic Museum, Nuremberg); "Vagabonds" (New Pinakothek, Munich); "Capuchin Monk in Peasant's Cottage" (1883, Leipzig Museum); "The Discussion" (Metropolitan Museum, New York).

SEITZ, sīts, DON CARLOS (1862–). An American newspaper manager, born at Portage, Ohio. In 1880 he graduated from the Liberal Institute at Norway, Me. He served as Albany correspondent (1887–89) and city editor (1889–91) of the Brooklyn *Eagle*, was assistant publisher of the New York *Recorder* (1892–93) and managing editor of the Brooklyn *World* (1893–94), and thenceforth was connected with the New York *World* as advertising manager (1895–97) and as business manager after 1898. His publications include: *Discoveries in Every-Day Europe* (1907); *Writings by and about James McNeill Whistler* (1910); *Elba and Elsewhere* (1910); *Surface Japan* (1911); *Letters from Francis Parkman to E. G. Squier* (1911); *The Buccaneers* (1912); *Whistler Stories* (1913).

SEIZING. See KNOTTING AND SPLICING.

SE'JANT (OF. *seant*, from Lat. *sedens*, pres. p. of *sedere*, to sit), or ASSIS (Fr.). In heraldry (q.v.), a term of blazon applied to a beast represented as sitting.

SEJA'NUS, Ælius (?–31 A.D.). A favorite and minister of the Emperor Tiberius (q.v.). Sejanus was born at Vulsinii. His father was Sejus Strabo, commander of the prætorian guard under Augustus. When Sejus Strabo became Governor of Egypt (14 A.D.), Ælius, so called from his adoption into the *Ælian gens*, was set over the prætorian cohorts, whom he united (23 A.D.) and with whose support he for a while held Rome in his sway. In order to make himself eventually Emperor, he persuaded Tiberius to withdraw to Capri. With Livia, wife of Drusus, whom he had debauched, he plotted and brought about in 23 the death of Drusus Cæsar (q.v.) and got rid of Agrippina (q.v.), wife of Germanicus, and her sons Nero and Drusus. Tiberius named Sejanus to be consul along with himself for the year 31 and then to be pontifex, but he became suspicious of Sejanus and had him killed with many of his suspected followers and his whole family. Our rather uncertain authority is Tacitus. Consult: Tacitus, *Annals*, iv, 1, 2, 3, 8, 39 ff., 74, and v, 6 ff.; Suetonius, *Tiberius*, 62; also Jülg, *Vita Lucii Ælii Sejani* (Innsbruck, 1882); J. C. Tarver, *Tiberius the Tyrant* (New York, 1902).

SEKI, sā'kē, KOWA. The most distinguished mathematician of the native Japanese school. He was born at Fujioka in the Province of Kōzuke, of Samurai stock, in 1642. He showed his mathematical abilities at an early age and developed into the greatest teacher of mathematics that Japan had known, being at the same time equally prominent as a discoverer. It is possible that he invented the *yenri*, or native calculus, but he certainly had the idea of determinants (q.v.) and did much to improve the algebra which had been inherited from the Chinese. Consult Smith and Mikami, *History of Japanese Mathematics* (Chicago, 1914).

SELACHII, sē-lā'kĭ-ī (Neo-Lat. nom. pl., from Gk. σέλαχος, *selachos*, shark). A group of fishes including the sharks and rays. See ELASMOBRANCHII. For fossil forms, see SHARK.

SEL'AGINEL'LA. See PTERIDOPHYTES.

SE'LAH. A rubrical note found in Hebrew psalms and prayers. It occurs as follows: in 39 Psalms, 71 times; in Habakkuk iii (properly a psalm), 3 times; in the *Eighteen Benedictions*, one of the most ancient portions of the Jewish liturgy, twice; also with more or less authority in other prayers of the Jewish ritual. In the Septuagint it is represented by the term *diapsalma;* the Hebrew text is generally followed, but the term is sometimes omitted, some-

times supplied, where not found in the Hebrew. The Selah is also found twice in the Greek *Psalms of Solomon* (63–48 B.C., translated from a Hebrew original). In two-thirds of the cases in the Bible it is found at the end of evident strophes, four times at the end of the psalm; in most of the remaining cases in connection with a quotation. In general, therefore, it indicates some natural break in the hymn. The most probable explanation is that advanced by Dr. C. A. Briggs, that the term is connected with a verb meaning "to lift up," in the sense of "raising" a hallelujah, and that it was the rubrical direction for choric doxologies, which are found at the end of the first four Books of the Psalms (xli. 13; lxxii. 18–19; lxxxix. 52; cvi. 48). Consult: Jacob, in *Zeitschrift für alttestamentliche Wissenschaft*, vol. xvi (Giessen, 1896); C. A. Briggs, in *Journal of Biblical Literature*, vol. xviii (Boston, 1899); E. C. Briggs, in *American Journal of Semitic Languages*, vol. xvi (Chicago, 1899); C. A. Briggs and E. C. Briggs, *Commentary on the Psalms* (New York, 1906–07).

SELBORNE, LORD. See PALMER, SIR ROUNDELL.

SEL'BORNE, WILLIAM WALDEGRAVE PALMER, second EARL OF (1859–). A British statesman. He was educated at Oxford, entered Parliament as a Liberal in 1885, but joined the Liberal-Unionists in 1886. He succeeded his father as Earl in 1895; in the same year he became Undersecretary of State for the Colonies, but left this post to become First Lord of the Admiralty in 1900. In 1905–10 he served as Governor of the Transvaal and High Commissioner for South Africa. Under his auspices self-government was introduced in the Transvaal in 1907. In 1915 he was appointed President of the Board of Agriculture in Asquith's coalition cabinet and attempted to organize national conservation. He was an ardent imperialist and tariff reformer. He is author of *The State and the Citizen* (1913).

SEL'BY. A river port in the West Riding of Yorkshire, England, on the Ouse, 20 miles east of Leeds (Map: England, E 3). An ancient Gothic cross adorns the market place. The famous parish church, 306 feet long by 60 feet wide, was part of a Benedictine abbey founded by William the Conqueror in 1068; it was partially destroyed by fire in 1906, but has since been restored. It is reputed the finest monastic church in England. Pop., 1901, 7800; 1911, 9048. Consult Morrell, *History of Selby* (Selby, 1867).

SELBY, first VISCOUNT. See GULLY, WILLIAM COURT.

SEL'CRAIG, ALEXANDER. See SELKIRK, ALEXANDER.

SEL'DEN, JOHN (1584–1654). An English jurist and savant. He was born at Salvington in Sussex, studied at Hart Hall, Oxford, and studied law at the Inner Temple. In 1610 appeared his *Janus Anglorum, Facies Altera* (Eng. trans., 1863), which dealt with the progress of English law down to Henry II, and in 1614 was published his *Titles of Honour*. In 1621 he was imprisoned by King James for giving legal opinion in favor of the House of Commons. In 1623 he was elected to Parliament for Lancaster. In 1626 he took part in the impeachment of Buckingham; in 1628 he played an important rôle in drawing up and passing the Petition of Right, and for his participation in the tumultuous closing scene of the Parliament of 1629 was committed to the Tower for two years. In 1640 he was chosen member for the University of Oxford. With Patrick Young and Richard James he compiled in 1628 a catalogue of the Arundel marbles (q.v.). He published, besides: *De Successionibus in Bona Defuncti Secundum Leges Hebræorum* (1634); *De Successione in Pontificatum Hebræorum Libri Duo* (Leyden, 1638); *De Jure Naturali et Gentium juxta Disciplinam Hebræorum* (1640). His *Mare Clausum* (published in 1635, though written 16 or 17 years before) was a reply to Grotius' *Mare Liberum*. His *Table-Talk*, recorded and published by his amanuensis, Richard Milward, in 1689 and reprinted (London, 1868), is the most famous of his works. Consult G. W. Johnson, *Memoirs of John Selden* (10 vols., New York, 1883–84), and Robert Waters, *John Selden and his Table-Talk* (ib., 1899).

SELDEN PATENT. See AUTOMOBILE.

SEL D'OR (Fr., salt of gold). A name given to sodium aurothiosulphate, which is used in photography. It was originally employed to aid in fixing the image on a daguerreotype plate. At present it is used in toning positive prints.

SELECTION, NATURAL. See NATURAL SELECTION.

SELECTION, SEXUAL. See SEXUAL SELECTION.

SELENE, sê-lē'nê (Lat., from Gk. Σελήνη, connected with σέλας, *selas*, brightness). The Greek name of the moon and its goddess, called also Μήνη, Mēnē, and in Latin Luna (q.v.). The most common account makes Selene a daughter of Hyperion and Theia and sister of Helios (the sun) and Eos (the dawn). She was represented as riding in a chariot drawn by a span of horses, winged, and shedding soft light from her golden crown, or else as riding on a horse or a mule. Most famous was her passion for Endymion (q.v.), who, according to the Carian legend, lay sunk in eternal sleep in a cave on Mount Latmos, where he was nightly visited by Selene. In Elis, however, the story told how she bore to Endymion, son of the King, 50 daughters. The sharply transparent character of the name seems to have kept Selene from developing into so distinct a personality as other early moon goddesses. When Apollo (q.v.) became so strongly identified with the sun it was only natural that Artemis should be restored to her position as a moon goddess, and in later literature and art we find the crescent an attribute of Artemis or Diana. Consult: Roscher, *Ueber Selene und Verwandtes* (Leipzig, 1890); id., *Nachträge* (ib., 1895); Otto Gruppe, *Griechische Mythologie und Religionsgeschichte* (2 vols., Munich, 1906); C. M. Gayley, *The Classic Myths in English Literature and in Art* (2d ed., Boston, 1911). See DIANA.

SELEN'GA. A river of north Asia, over 700 miles long, rising in the Khangai Mountains of Mongolia. It flows first in a northeasterly direction, then, turning to the north, passes into the Siberian territory of Transbaikalia, and enters Lake Baikal through a wide delta (Map: China, H 2). Its swift current interferes to some extent with navigation, but it is an important factor in the commercial intercourse between Mongolia and Siberia, flowing through the most settled part of Transbaikalia and touching the Trans-Siberian Railway. Boats ascend to Kiakhta, 210 miles. Its fisheries,

which are exploited on a considerable scale, also add to the economic importance.

SEL'ENITE (Lat. *selenites, selenitis*, from Gk. *σεληνίτης*, relating to the moon, from *σελήνη, selēnē*, moon). The variety of calcium sulphate, or gypsum, that is crystallized in the monoclinic system. It is usually white or tinged with light shades of green, gray, or yellow. It sometimes occurs in broad transparent sheets as much as one yard across. In this condition the mineral is capable of being split into extremely thin plates that are flexible and were used by the ancients in place of glass.

SELE'NIUM (Neo-Lat., from Gk. *σελήνη, selēnē*, moon). A chemical element discovered in 1817 by Berzelius, who obtained it from crystals formed in the lead chambers of sulphuric-acid works. The element is somewhat widely distributed, though in small quantities. It occurs chiefly in combination with copper, lead, and silver, as in clausthalite (lead sulphide), lehrbachite (lead and mercury sulphide), onofrite (mercury selenide and sulphide), crookesite (copper, thallium, and silver selenide); also in smaller quantities in other minerals, especially in certain pyrites and chalcopyrites. In 1909 Warren discovered the presence of some selenium in iron of meteoric origin. Selenium is obtained chiefly from the flue dust formed in roasting sulphides containing selenium or from the deposits in the lead chambers of sulphuric-acid works. These deposits are mixed with equal parts of sulphuric acid and water to a thin paste and then boiled, with the addition, from time to time, either of a little sodium nitrate or of a mixture of common salt and potassium permanganate, until the red color disappears, and the solution of selenic acid thus obtained is heated with fuming hydrochloric acid, yielding selenious acid, the cold solution of which, when saturated with sulphur dioxide, furnishes a red pulverulent precipitate of selenium.

Selenium (symbol Se; atomic weight, 79.2) exists in several allotropic forms, of which the red or amorphous variety, which is soluble in carbon disulphide, has a specific gravity of 4.26 and has no definite melting point, but softens gradually on heating. When the soluble selenium is slowly heated from 100° C. (212° F.) to 217° C. (422.6° F.), it passes into a black, glossy, metallic crystalline mass, which has a specific gravity of 4.8, is insoluble in carbon disulphide, and melts at 217° C. If selenium is dissolved in caustic potash at 230° C. (446° F.) and the solution gradually cooled, another metallic modification of selenium is obtained, which melts at 219° C. (426.2° F.). Selenium is both odorless and tasteless, but it burns with a reddish-blue flame that has a peculiar odor resembling horse-radish. The crystalline variety of the element conducts electricity, its resistance increasing when heated, but diminishing considerably on exposure to light, especially red rays. The change of conductivity is very great, and even light from an ordinary lamp has a measurable effect upon it. It was upon this property that the construction of the photophone (q.v.) was based. With oxygen selenium forms a dioxide, which combines with water to form selenious acid. A selenic acid is produced by the action of chlorine on aqueous selenious acid. Selenious and selenic acids form salts, respectively selenites and selenates, corresponding to the sulphites and sulphates.

SELENKA, zā-lĕŋ'kȧ, Emil (1842–1902). A German zoölogist, born in Brunswick and educated there and at the University of Göttingen. In 1868 he was made professor of zoölogy and comparative anatomy at Leyden, and in 1874 he accepted a chair in Erlangen. After his resignation in 1896 he removed to Munich. In 1877 he went to Brazil and in 1892 to Ceylon. His works deal chiefly with comparative anatomy and embryology of the vertebrates, *Zoologische Studien* (1878–81) and *Studien über die Entwickelungsgeschichte der Tiere* (1883–1906) being the chief titles. He founded with Rosenthal and Rees the *Biologisches Zentralblatt* in 1881.

SELER, zā'lēr, Eduard (1849–). A German anthropologist, born at Crossen-on-the-Oder. He was educated at the universities of Breslau and Berlin and in 1892 entered the Royal Museum of Ethnology at Berlin, of which he became divisional director. His published works are among the most important on Central American and Aztec civilization. He edited several important Mexican manuscripts and wrote: *Reisebriefe aus Mexiko* (1889); *Altmexikanische Studien* (1890–99); and, most valuable of all his works and probably of all books on this subject, his *Gesammelte Abhandlungen* (1902–08). His wife, Cäcilie, wrote *Auf alten Wegen in Mexiko und Guatemala* (1900).

SELEUCIA, sē-lū'shĭ-ȧ (Lat., from Gk. *Σελεύκεια, Seleukeia*). The name of a number of ancient cities of Asia, founded during the earlier existence of the dynasty of the Seleucidæ (q.v.). The most noted of these were: (1) Seleucia Pieria (near the modern Suadeiah), founded by Seleucus Nicator at the foot of Mount Pieria, on the seashore, about 4 miles north of the mouth of the Orontes. It was the seaport of Antioch and became of importance during the wars between the Seleucidæ and the Ptolemies for the possession of Syria. Its once magnificent port is still in good preservation, while the tunnel, 1088 yards in length, excavated out of solid rock and forming the only communication between the city and the sea, together with the remains of its triple line of walls, its citadel, temples, amphitheatre, and necropolis, attest the former importance and splendor of the city. Seleucus himself was buried there. In 246 B.C. the city was taken by Ptolemy Euergetes, but Antiochus the Great recaptured it in 219. In 108 it gained independence, which Pompey confirmed in 70. By the fifth century A.D. it had entirely decayed. (2) Seleucia ad Tigrim was also built by Seleucus Nicator on the west bank of the Tigris, about 40 miles northeast of Babylon, which was despoiled to supply materials for the construction of the new city. Controlling the navigation of the Tigris and Euphrates, as well as the commerce of Mesopotamia, it rapidly rose to wealth, supplanting Babylon as the capital of the eastern portion of the Seleucid monarchy and containing at the time of Pliny a population of more than 600,000. During the decline of the Seleucid monarchy it became independent and attracted, because of its wealth, the robber tribes of southern Armenia and Media, who often plundered it. It was burned by Trajan (116 A.D.) and subsequently by Lucius Verus, and when visited by Septimius Severus was desolate. (3) Seleucia Tracheotis (on the site of the modern Selefke) was also built by Seleucus on the western bank of the Calycadnus

in Cilicia Aspera. It was a rival of Tarsus and was the birthplace of several famous men, among them the philosopher Xenarchus. Its site is still covered with its ruins. (4) SELEUCIA was likewise the name of a city in Margiana, originally built by Alexander the Great and called Alexandria. Antiochus I, who rebuilt it after its destruction by the barbarians, renamed it in honor of his father, Seleucus Nicator. The Roman prisoners taken by the Parthians at the defeat of Crassus (q.v.) were colonized here. (5) SELEUCIA IN MESOPOTAMIA (modern Bir) was a fortress on the left bank of the Euphrates, opposite the ford of Zeugma. There were several other cities of this name, as that on the river Belus, in Syria; on the plain of Isparta, in Pisidia; in Pamphylia, near the mouth of the Eurymedon; and elsewhere; while the city of Tralles (q.v.) was at one time called Seleucia. Consult Bouché-Leclercq, *Histoire des Séleucides* (2 vols., Paris, 1913–14).

SELEU'CIDÆ, or **SELEU'CIDS.** The dynasty which ruled over that portion of Alexander the Great's monarchy which included Syria, a large portion of Asia Minor, and the whole of the eastern provinces of Bactria, Sogdiana, Persia, and Babylonia.

Seleucus I Nicator (312–c.281 B.C.), the first of the line, was the son of Antiochus, a general of Philip of Macedon. He had been one of the conspirators against Perdiccas (321 B.C.) and in the second partition of the provinces constituting Alexander's realm, Babylonia fell to his lot. To this, with the aid of Antigonus, he added Susiana; but a misunderstanding arose between the two generals, and Seleucus took refuge in Egypt (316 B.C.). Four years later Seleucus returned to his satrapy. The date of Seleucus' return to Babylon was the beginning of the era of the Seleucidæ, which was employed by the Syrians and Asiatic Greeks until the fifteenth century. Recovering Susiana, Seleucus subjugated Media and extended his power to the Oxus and Indus. Of his campaign (306–302 B.C.) against the Indian King Sandrocottus (q.v.) there are but few facts known. In 305 B.C. he assumed the title of King, and three years later he joined the confederacy of Ptolemy, Lysimachus, and Cassander against Antigonus and by his elephants decided the issue of the battle of Ipsus in 301 B.C. against his quondam ally, who was killed in the fight. Being now the most powerful of Alexander's successors, he obtained the largest share in the conquered Kingdom, a part of Asia Minor and the whole of Syria falling to him. In 294 he gave the provinces beyond the Euphrates to his son, Antiochus, who afterward succeeded him. He later waged successful wars against Demetrius, King of Macedon (286), and Lysimachus, King of Thrace (281). He was assassinated in 281 B.C. by Ptolemy Ceraunus. His son and successor was Antiochus I Soter (c.281–261), followed by his son Antiochus II Theos (261–246), who was poisoned by his former wife, Laodice, mother of Seleucus II Callinicus (246–226). Seleucus II was driven from his Kingdom by Ptolemy Euergetes (q.v.). He recovered his throne on Ptolemy's withdrawal (243) and succeeded in holding Syria and most of Asia Minor against both the Egyptians and his younger brother, Antiochus, who attempted to exercise independent authority over part of Asia Minor. Seleucus undertook an expedition against the revolted provinces of Parthia and Bactria about 235 B.C., but was routed by Arsaces the Great (see ARSACIDÆ), while in the west several provinces were wrested from his brother by Attalus I, the King of Pergamum (229–227). His sons, Seleucus III Ceraunus (226–223) and Antiochus III the Great (223–187), were his successors. The latter was vanquished by the Romans at Magnesia in 190 B.C. and forced to relinquish a great part of Asia Minor. Seleucus IV Philopator (186–175) was eager to dispossess Eumenes II of the provinces which his father, Attalus, had taken, but fear of the Romans prevented him from carrying out his design. He was succeeded by Antiochus IV Epiphanes (175–164), in whose reign the Jews rose under the Maccabees. The succeeding princes of the dynasty were Antiochus V Eupator (164–162); Demetrius I Soter (162–150), who was defeated and slain by the impostor Alexander Balas (150–145); Demetrius II Nicator (145–138, 129–125), who overthrew the impostor and was himself a prisoner among the Parthians for 10 years, Syria having been seized by Diodotus, surnamed Tryphon, who set up the puppet Antiochus VI Theos (145–140) and afterward ascended the throne himself (140–137); Antiochus VII Sidetes (139–129), who restored the royal line of the Seleucidæ, after whom Demetrius again reigned until his defeat by the pretender Alexander II Sebina, his rule marking the loss of the original centre of Seleucian power to the Parthians; Seleucus V (125); Antiochus VIII Grypus (125–96), who was compelled to share his dominions with his half brother, Antiochus IX Cyzicenus, from 111 B.C.; Seleucus VI Epiphanes (96–95) and Antiochus X Eusebes (94–92), who continued the division until about 94 B.C., when the latter was victorious in a pitched battle and seized the Kingdom, for which, however, he was forced to fight with Philip I (95–83) and Antiochus XI Epiphanes (q.v.), the younger brother of Seleucus, and Demetrius III Eucærus (95–87), a third brother of Seleucus, who, with Philip, next claimed the sovereignty, which was taken from them by Tigranes (84–69), King of Armenia, at the solicitation of the Syrians; Antiochus XII Dionysus (q.v.), a fourth brother of Seleucus, and Antiochus XIII Asiaticus (69–64), who came into conflict with the Romans and was deprived of his possessions, which were converted into a Roman province by Pompey in 64 B.C. Consult: Bernard Haussoullier, *Etudes sur l'histoire de Milet et du Didymeion* (Paris, 1902); E. R. Bevan, *House of Seleucus* (2 vols., London, 1902); G. Macdonald, "Early Seleucid Portraits," in *Journal of Hellenic Studies*, vol. xxiii (ib., 1903); Bouché-Leclercq, *Histoire des Séleucides* (2 vols., Paris, 1913–14).

SELEU'CUS. See SELEUCIDÆ.

SELF (AS. *self, seolf*, Goth. *Silba*, OHG., Ger. *selb*, self; perhaps connected with Ir. *selb*, possession). In psychology, an individual mind. Mind may be regarded as experience which is considered as dependent upon nervous process in general; the self, an individual mind, is then experience taken as depending upon a particular nervous system, i.e., upon the nervous processes of a biological individual. No such distinction is possible with respect to matter, for in physical science there is no reference to a nervous system which may be taken either as general or as individual. The difference within psychology is reflected in the distinction between general psychology and differential or individual

psychology (q.v.); the former has mind for its subject matter, the latter particular minds or selves. The self is constituted as a particular combination of talent, temperament, and character—descriptive concepts of individual psychology which arise from the individualization of the general psychology of thought, feeling, and will; but a full scientific analysis of the individual differences of selves is still lacking.

The origin of the idea of self is partly social and partly individual. Every person is an *object* to other persons. He is treated as a permanent being, as a centre of activity, and as a unit in the community. In addition his own experience is more or less coherent, more or less continuous, and his conscious actions lead him to consider himself as an originator in the external world of things. Consult H. A. Bruce, *The Riddle of Personality* (new ed., New York, 1915). See SELF-CONSCIOUSNESS.

SELF-CONSCIOUSNESS. The self (q.v.) in experience, i.e., any mental formation which carries the meaning of self. Self-consciousness is not limited to particular mental patterns; the self-reference may be carried by perception, idea, attitude, emotion. (The self-reference may also be unconscious, but in such a case there would be, of course, no self-consciousness.) These various formations are, however, characterized by certain frequently recurring processes, especially by the verbal ideas "I" and "my," by visual and tactual perceptions and ideas of the body, by emotive attitudes like those of self-complacency and self-satisfaction, and by a mass of relatively stable organic sensations, which are not ordinarily analyzed and referred to their various points of origin, but which come to consciousness "in the lump." The constancy of all these things depends upon the permanency of the nervous determinations which underlie them; there is, as has been said, no fixed mental pattern which always means the self. Some psychologists maintain that the self-reference is persistent in consciousness and that all mental life occurs in relation to a conscious self. Others declare that the reference is of comparatively rare occurrence and that it appears only in those situations in which the environment ceases to be of primary interest and attention is focused on the person of the individual. The question is as yet undecided, though scientific introspection has failed to reveal a persistent self. The argument that introspection has not been so directed as to bring out the universal self-reference has yet to be supported by experiments. It is, indeed, doubtful whether an attitude which should show a persistent self would still be that of scientific observation.

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SELF-DEFENSE. In law, the defense of one's person or property from threatened violence or injury by the exercise of force. Self-defense is one of the forms of remedy by self-help (q.v.). In general one may defend himself from assault or unlawful attack by the use of force, provided he use no more force than is necessary to accomplish that result, and his act will give rise to no civil or criminal liability. If he use more force than is necessary to repel the attack, he will be liable both civilly and criminally for assault. Under these conditions both the assailant and the person assailed may be guilty of assault. The rule that, in the exercise of his right of self-defense, one may meet force with force is subject to one other important qualification. He may not carry his forcible resistance to the point of taking life when he may safely retreat from his assailant. Whenever the circumstances will not permit him to retreat from his assailant with apparently reasonable safety, he may kill his assailant if such action be necessary to protect his own life or to protect his person from severe bodily injury, and his act will be deemed justifiable homicide (q.v.). Under any other circumstances the killing of an assailant under guise of self-defense is manslaughter (q.v.) and may be murder (q.v.) in the first degree if the killing is premeditated or murder in the second degree if a dangerous weapon is used even without premeditation. Upon the principle of self-defense one may forcibly resist an illegal arrest. The resistance, however, must fall short of taking life unless the consequence of the arrest would be to take the prisoner to an uncivilized country, where he would be beyond the reach of legal process. In that case he may kill if necessary to prevent the arrest. One may also forcibly resist an unlawful attack upon another, particularly if that other is one who has a natural claim to his protection, as a wife, child, or even a servant who is a member of his family. The law of defense of property is precisely like that relating to the defense of the person, except that under no circumstances is the taking of life as a means of protecting property justifiable. One who kills to protect property is guilty of manslaughter, and if the killing is premeditated or done under circumstances of aggravation, it may be murder.

The law also recognizes a distinct right to protect the dwelling house, as it is called, which combines the characteristics of both defense of the person and defense of the property. At common law one's dwelling house was said to be his castle. The true meaning of the phrase is that one has the right to make his dwelling a means of defense. Once inside his dwelling, or "at the threshold" as it was said, he might forcibly resist attacks upon himself and the other inmates of the dwelling and, without retreating, kill his assailant if necessary to repel the attack. See HOMICIDE; MANSLAUGHTER; MURDER; REMEDY.

SELF-DENYING ORDINANCE. A measure carried through the English Parliament in 1645 by the influence of Cromwell and the Independents, with the view of removing inefficient or lukewarm commanders from the army. The ordinance proposed that no member of either House should, during the war, enjoy or execute any office or command, civil or military, and that those holding such offices should vacate them in 40 days. It was intended to take the executive power out of the hands of the more moderate politicians and form an army independent of Parliament, and was the subject of violent and protracted debate, but eventually passed in both Houses and became law. Essex, Warwick, Manchester, and others resigned, and

the conduct of the war was intrusted to Fairfax. Cromwell, to whom, as a member of the Lower House, the Self-Denying Ordinance extended as much as to Essex and the rest, had the duration of his commission prolonged by the Commons on account of his invaluable services as a leader of cavalry, and by his brilliant achievements soon surpassed his commander in reputation.

SELF-HELP. A legal phrase signifying that form of remedy by which one may prevent or redress a wrong without resorting to a legal proceeding, as, e.g., the right of self-defense, the right to abate a nuisance, the right of the owner to retake property of which he has been wrongfully deprived. These remedies are survivals from primitive law, which in its earliest stages leaves to the injured person or his kinsmen the righting of wrongs or the infliction of revenge for such wrongs. See DEFENSE; DISTRESS; LAW; NUISANCE; REMEDY; SELF-DEFENSE.

SELF-INDUCTION. See ELECTRICITY, *Induced Electric Currents.*

SELF-INSURANCE. See FIRE INSURANCE.

SELF-OBSERVATION. See INTROSPECTION.

SELF-RAISING FLOUR. See BREAD.

SELF'RIDGE, H. GORDON (1863–). A British merchant. He was born in Ripon, Wis., and was brought up in Jackson, Mich. From 1890 to 1904 he was a member of the Chicago department-store firm of Marshall Field & Co. After five years' retirement he established in London the great department store of Selfridge & Co.

SELFRIDGE, THOMAS OLIVER (1836–). An American naval officer, named for his father. He was born in Boston, Mass., and was educated at Annapolis. In the Civil War he commanded the *Osage* in the Red River expedition, during which he inflicted a heavy loss on the Confederates at Blair's plantation and later led a division of the landing sailors which successfully assaulted Fort Fisher. After the war he directed the surveys for the canal across the Isthmus of Panama in 1869–73, was a member of the Infernational Congress held at Paris to consider the question of that canal in 1876, and, while in charge of the Newport torpedo station (1881–85), invented a means of protecting ships from torpedoes. In 1896 he became rear admiral and in 1898 retired.

SELF-STARTER, IN MOTOR VEHICLE. See MOTOR VEHICLE.

SEL'IGMAN, EDWIN ROBERT ANDERSON (1861–). An American economist, born in New York City. He graduated from Columbia in 1879, spent three years in study at Berlin, Heidelberg, Geneva, and Paris, and returned to his alma mater to take the degrees of LL.B. and Ph.D. in 1884. At Columbia he remained as lecturer, rising to be professor of political economy and finance (1891–1904) and thereafter McVickar professor of political economy. Coming to be recognized as one of the leading economists of the country, and an authority especially on taxation, Professor Seligman served on numerous important committees and commissions, including President Roosevelt's commission on statistical reorganization (1908). In 1902–04 he held the presidency of the American Economic Association, and until 1910 he was chairman of the trustees of the Bureau of Municipal Research. Editorially he was identified with the *Political Science Quarterly* and with the *Columbia Studies in History, Economics, and Public Law.* His writings include: *Railway Tariffs and the Interstate Commerce Law* (1887); *Two Chapters on the Mediæval Guilds of England* (1887); *The Shifting and Incidence of Taxation* (1892; 3d ed., enlarged, 1910); *Essays in Taxation* (1895; 3d ed., 1900); *The Economic Interpretation of History* (1902); *Progressive Taxation* (2d ed., 1908); *Principles of Economics* (1905; 6th ed., 1914); *The Income Tax* (1911).

SELIGMANN, CHARLES G. (1873–). An English ethnologist. He was educated at St. Paul's School and studied medicine at St. Thomas's Hospital, London, where he became house physician and director of the clinical laboratory. He was a member of the Cambridge anthropological expedition to Torres Strait and Borneo and of the Daniels expedition to New Guinea, traveled in Africa and Ceylon, and became professor of ethnology in the University of London. He wrote *The Melanesians of British New Guinea* (1910) and *The Veddas* (1911).

SE'LIM, *Turk. pron.* sâ-lēm'. The name of three sultans of the Ottoman Empire.—SELIM I, son of Bajazet II (c.1467–1520). He became Sultan in 1512, after dethroning his father with the aid of the Janizaries. To secure himself, he caused his father, brothers, and nephews to be put to death, thus beginning a policy which won for him the surname of the Inflexible. In 1514 he invaded Persia and massacred 40,000 Shiites. He defeated the army of Shah Ismail near Khoi in Azerbaijan, conquered Mesopotamia and Kurdistan, overran Armenia, and, leaving his lieutenants to complete this conquest, marched against Kansuh el Ghuri, Mameluke Sultan of Egypt. The Mameluke army was totally defeated (1516) at Marj Dabik, and Syria became the prize of Selim. Kansuh's successor, Tuman Bey, succumbed to the Turkish arms, and Egypt was incorporated with the Ottoman Empire (1517). The last lineal descendant of the Abbaside caliphs, who was then resident in Egypt, transmitted to Selim the title of Imam and the standard of the Prophet. The Ottoman Sultan thus became chief of Islam, as the representative of Mohammed, and the sacred cities of Mecca and Medina acknowledged his supremacy. Selim laid the foundation of a regular navy, constructed the arsenal of Pera, disciplined the Janizaries, and improved the organization of his Empire. Selim was an able statesman and a lover of literature and poetry. He was succeeded by his son, Solyman the Magnificent.

SELIM II (1524–74), known as the Drunkard, was the son of Solyman the Magnificent. He succeeded his father in 1566. The Turkish dominions were extended by the subjugation of Yemen (1570) and the conquest of Cyprus from the Venetians (1571), but the naval power of the Ottoman Empire suffered a blow in the defeat at Lepanto (q.v.) in 1571, from which it never recovered.

SELIM III (1761–1808) was the only son of Mustapha III and ascended the throne on the death of his uncle, Abd ul Hamid I, in 1789. He inaugurated a radical progressive policy to counteract the dangers that threatened his Empire. He inherited a war with Russia and Austria, which he closed by the Treaty of Sistova with Austria (1791) and that of Jassy (1792) with Russia, whose frontiers were advanced to the Dniester. The invasion of Egypt by Napoleon (1798) led to war with France, which was concluded by a treaty signed in 1802, the Sultan

remaining thereafter friendly to the French. In attempting to reorganize the army on a European model and to introduce innovations in industry Selim III aroused all the bigotry of his subjects. In May, 1807, a formidable rebellion broke out at Constantinople, headed by the Janizaries, and the Sultan was compelled to issue a decree abrogating his reforms; but this failed to satisfy the leaders of the insurrection, and Selim was forced to resign the throne to his cousin, Mustapha IV. In the 1808 uprising Mustapha Bairaktar, the Pasha of Rustchuk, one of the Sultan's chief advisers, marched upon Constantinople to reinstate Selim on the throne, but the unfortunate monarch was strangled by order of Mustapha IV.

SELIM'NIA. See SLIVEN.

SELINCOURT, sā'lăn'kōōr', MRS. BASIL DE. See SEDGWICK, ANNE DOUGLAS.

SELINCOURT, ERNEST DE (1870–). An English scholar, born at Streatham and educated at Dulwich College and at University College, Oxford (A.M. and Litt.D.), where from 1896 to 1909 he was lecturer in the English language and literature. From 1899 to 1909 he was also university lecturer on modern English literature. As examiner his services were had by Oxford, the University of Wales, and the University of London. His publications include: *Hyperion* (1905), a facsimile of Keats's manuscript, edited with critical introduction and notes; *Poems of Keats* (1906); *Wordsworth's Guide to the Lakes* (1906), a critical edition; *Minor Poems of Spenser* (1910), with introduction and notes; *Poems of Spenser* (1912), with biographical and critical introduction; *English Poets and the National Ideal* (1915).

SELI'NUS (Lat., from Gk. Σελινοῦς, *Selinous*). An ancient Greek colony in southwest Sicily, at the mouth of the Selinus River. It was founded about 629 B.C. by colonists from Megara Hybla. Its constant wars with the neighboring Elymi of Segesta (q.v.) led to the Athenian expedition against Syracuse (415 B.C.) and later to Carthaginian intervention, which resulted in the destruction of the city (409 B.C.). Though reëstablished, the city never regained its former prosperity, and during the First Punic War (c.250 B.C.) the Carthaginians removed the inhabitants to Lilybæum. The ruins include the walls of the ancient Acropolis on a hill above the sea, the Necropolis, and especially the temples, seven in number in two groups, four on the Acropolis and three on a hill to the east, one of which is among the largest Greek temples known. It has an extreme length of about 371 feet and breadth of 177 feet, while the cella alone is 228 × 59 feet. The sculptures of these temples are of importance in the history of Greek art. Consult E. A. Freeman, *The History of Sicily from the Earliest Times*, vol. iii (Oxford, 1892), and K. Baedeker, *Southern Italy and Sicily* (16th Eng. ed., Leipzig, 1912). For the sculptures at Selinus, see GREEK ART, *History*, I. The Archaic Period, and consult: Benndorf, *Die Metopen von Selinunt* (Berlin, 1873); R. Koldewey and O. Puchstein, *Die griechischen Tempel in Unteritalien und Sicilien* (ib., 1899); R. B. Richardson, *Greek Sculpture* (New York, 1911); E. A. Gardner, *A Handbook of Greek Sculpture* (London, 1911).

SELJUKS, sĕl'jōōks. A Turkish dynasty which ruled over a great part of western Asia in the eleventh, twelfth, and thirteenth centuries. A few years after the death of Mahmud of Ghazni (q.v.) in 1030, the Ghuz Turks, under the leadership of two brothers, Chakyr Beg and Tughrul (Togrul) Beg, grandsons of a chieftain named Seljuk, overran Persia and made themselves masters of it. Tughrul Beg established his authority in the dominions of the Caliph of Bagdad, by whom he was proclaimed King of the East and of the West. In 1063 Tughrul died and was succeeded by his nephew, Alp-Arslan (q.v.), who was in turn succeeded by Malik Shah (1072–92), in whose reign the Seljuks established their dominion in Syria and Asia Minor, where independent sovereignties were founded. In Asia Minor arose the Sultanate of Iconium (Konieh) or of Rum (i.e., the land of the Greeks or Byzantines, whose country was known to the Mohammedans under the name of *Rum*, Rome). Towards the end of Malik Shah's reign arose the sect of the Assassins (q.v.). Malik Shah was followed by his sons, Nasir ad Din (1092–94) and Barkiyarok (1094–1104), both rulers of little initiative. Another son, Mohammed (1104–18), proved more energetic. He made an active campaign against the Assassins and was on the point of reducing them by famine when he died. He was followed by his last surviving brother, Sanjar (1118–57). This monarch paid little attention to the provinces west of Khorassan, which were broken up into little principalities, but retained firm control of the eastern districts as far as Transoxania. Within less than half a century after his death the remnants of Seljuk dominion in Iran were swept away by the Khwaresmians. In 1096 the Seljuks came into collision with Western Christendom, whose armies in the First Crusade took Jerusalem in 1096. The armies of the Second Crusade (1147–48) fought unsuccessfully against Nureddin, who made himself master of Syria and whose dominions after his death (1174) became the prey of Saladin, Sultan of Egypt. The Sultanate of Rum outlived the other Seljuk realms, surviving till the close of the thirteenth century, when it was broken up into fragments on whose ruins the Ottoman Turks laid the foundations of their Empire.

The Seljuk period is noteworthy in the history of Persian literature as being its second golden age. At the court such poets as Omar Khayyam, Farid ud Din Attar, Jalal ud Din Rumi Sadi, and Anvari (qq.v.) were honored, while art and science flourished as they have never since flourished in Persia.

Consult: M. T. Houtsma (ed.), *Recueil de textes relatifs à l'histoire des Seldjoucides* (2 vols., Leyden, 1886–91); Friedrich Sarre, *Reise in Kleinasien: Forschungen zur seldjukischen Kunst und Geographie des Landes* (Berlin, 1896); Horn, "Geschichte Irans in islamitischer Zeit," in Geiger and Kuhn, *Grundriss der iranischen Philologie*, vol. ii (Strassburg, 1900).

SEL'KIRK. A town and the capital of Selkirk District, Manitoba, Canada, situated on Red River, at the head of Lake Winnipeg navigation, on the Canadian Pacific Railway, 22 miles by rail north-northeast of Winnipeg (Map: Manitoba, G 3). The fishing industry of Lake Winnipeg is centred here. There are government shipyards and dry docks. The town is a summer resort. Pop., 1900, 2188; 1911, 2977.

SELKIRK, or **SELCRAIG,** ALEXANDER (1676–1723). An English mariner, supposed prototype of Robinson Crusoe. He was born at Largo, Fifeshire, and early joined privateering expeditions to the South Seas. In 1704, when

sailing master of the *Cinque Ports*, he quarreled with the captain and was at his own request put ashore upon the island of Juan Fernández. After a residence there of four years and four months, he was rescued by Capt. Woodes Rogers, who subsequently gave him command of the *Increase* prize ship. He again went to sea and rose to be lieutenant of H.M.S. *Weymouth*, on board of which he died. In 1712 there appeared Captain Rogers's *Cruising Voyage round the World* and Capt. Edward Cooke's *Voyage to the South Sea*, from which Defoe is thought to have obtained most of the information he possessed respecting Selkirk. Selkirk is also the subject of Cowper's *Lines on Solitude*. Consult John Howell, *Life and Adventures of Alexander Selkirk* (Edinburgh, 1829). See JUAN FERNÁNDEZ.

SELKIRK, THOMAS DOUGLAS, fifth EARL OF (1771–1820). A colonizer and man of letters, born in Kirkcudbrightshire, Scotland, and educated at the University of Edinburgh. His life was devoted mainly to directing emigration from the Scottish Highlands to British North America. In 1803 he made a settlement at Prince Edward Island, which from the first was prosperous, and, after heroic efforts and a bloody conflict with the Northwest Fur Company, he finally established, under the auspices of the Hudson's Bay Company, a colony in the Red River valley, now the flourishing Province of Manitoba (1817). In 1818 he left America and, completely broken in health, went to Pau in southern France, where he died. An account of his troubles in settling the Red River territory is given in his *Sketch of the British Fur Trade in North America* (1816). Consult: George Bryce, *Manitoba* (London, 1882); id., *Life of Lord Selkirk* (Toronto, 1912); *Canada and its Provinces*, vol. xix (ib., 1914).

SELKIRK MOUNTAINS. A mountain range in the southeastern part of British Columbia, lying west of and nearly parallel to the Rocky Mountains, from which it differs in geological formation and from which it is separated by the long, narrow, and straight valley of the upper Columbia River. The latter, with its tributary, the Kootenay, and Kootenay Lake, almost completely encircles the range, which is about 200 miles long and 80 miles wide. Although lower than the neighboring Rockies, the Selkirk Range is much more alpine in character and consists of rugged peaks, snow fields, glaciers, and precipices, below which the slopes are densely timbered to a height of 6000 feet. The highest peak is Mount Sir Donald, with an altitude of 10,645 feet. The Canadian Pacific Railroad crosses the range at an altitude of 4300 feet through Roger's Pass, which with the surrounding magnificent region forms the Glacier Park Reserve. Consult Green, *Among the Selkirk Glaciers* (London, 1890), and H. Palmer, *Mountaineering and Exploration in the Selkirks: A Record of Pioneer Work among the Canadian Alps* (New York, 1914).

SEL'KIRKSHIRE (anciently called Ettrick Forest). A county of southeast Scotland (Map: Scotland, E 4). Area, 267 square miles. Pop., 1901, 23,340; 1911, 24,600. It consists mainly of the two parallel valleys through which flow the rivers Ettrick and Yarrow. It is largely a pastoral county. The mountains, the highest of which is Dun Rig (2433 feet), are rounded at the top instead of peaked and are covered generally with grass, affording excellent pasturage. The former extensive woods have disappeared. Capital, Selkirk. Consult Craig-Brown, *History of Selkirkshire* (Edinburgh, 1886).

SEL'LA, QUINTINO (1827–84). An Italian scientist and statesman, born at Mosso, near Biella. He was educated at the University of Turin and at the School of Mines, Paris, and was for a time professor in the Turin Mining Academy, attaining a wide reputation as engineer and mineralogist. In 1860 he was elected to the Chamber of Deputies. In 1861 he became general secretary in the Department of Public Instruction. He held the position of Minister of Finance three times—in 1862 under Rattazzi, in 1864–65 under La Marmora, and from 1869 to 1873 under Lanza. He showed himself a good financier and an excellent parliamentarian. He was president of the Accademia dei Lincei (q.v.).

SEL'LA CURU'LIS. See CURULE CHAIR.

SEL'LAR, WILLIAM YOUNG (1825–90). A Scottish classical scholar, born in Sutherlandshire, Scotland, and educated at Glasgow University and Balliol College, Oxford. In 1851 he was appointed assistant to the professor of Latin in Glasgow, and in 1853 he went to St. Andrews as assistant to the professor of Greek, whom he succeeded six years later. In 1863 he was made professor of Latin in the University of Edinburgh, a position which he held till his death. He wrote: *Roman Poets of the Republic* (1863; 3d ed., 1889); *Roman Poets of the Augustan Age: Virgil* (1877); *Horace and the Elegiac Poets* (ed. by W. P. Ker, 1892). The three books are learned and brilliant. Consult the memoir, by Andrew Lang, prefixed to the book on Horace.

SEL'LERS, COLEMAN (1827–1907). An American engineer and inventor, born in Philadelphia, Pa. He was associated with the Globe Rolling Mills at Cincinnati, Ohio, the Niles Company locomotive works, and afterward became a partner with his kinsman in the firm of William Sellers & Co., manufacturers of tools. His inventions include a coupling device for connecting shafting, an arrangement for feed disks for lathes, and a kinematoscope. In 1881 he became professor of mechanics in Franklin Institute and in 1886 nonresident professor of engineering practice in the Stevens Institute of Technology. It was through his advice as consulting engineer that the work of developing the water power of Niagara was undertaken, and he became head engineer in that enterprise. Sellers was president of Franklin Institute in 1870–75 and of the American Society of Mechanical Engineers in 1886.

SELLERS, COLONEL MULBERRY. A Western speculator, in whose eyes every scheme had "millions in it," in *The Gilded Age*, a novel by Mark Twain and C. D. Warner.

SELLERS, MATTHEW BACON (?–). An American aëronautical engineer. After completing his education in France and Germany he became interested in aëronautics about 1900. He was one of the first to investigate and determine the amount of dynamic air pressure on arched surfaces by means of the wind tunnel. His "stopped aëroplane" was the lightest that had been built and required the least horse power. In 1915 Sellers was appointed by Secretary Daniels to the United States Naval Advisory Board.

SELLERS, WILLIAM (1824–1905). An American manufacturer and mechanical engineer, born in Delaware Co., Pa. In 1847 he became connected with a tool-manufacturing business, later known as William Sellers & Co. Inc. In 1868

he became president of the Edge Moor Iron Company and from 1873 to 1887 was head of the Midvale Steel Company of Nicetown, Pa. The Edge Moor Iron Company made the ironwork for the buildings of the Philadelphia Centennial Exposition and for the Brooklyn (N. Y.) Bridge. In 1864 he published the first formula for screw threads and nuts, now standard in the United States and regularly used in Europe. Sellers was president of Franklin Institute in 1864–67.

SELLIN, sĕl-lēn′, ERNST (1867–). A German Orientalist, born in Altschwerin, Mecklenburg. Educated at Rostock, Erlangen, and Leipzig, he was professor in the evangelical theological faculty of Vienna in 1897–1908, then professor at Rostock, and after 1913 at Kiel. He carried on important excavations at Tell ta Annek (described in his book of that name, 1904) and at the Canaanite site of Jericho. (Consult his *Jericho*, 1913.) He wrote: *Biblische Urgeschichte* (1905); *Die Spuren griechischer Philosophie im Alten Testament* (1905); *Rätsel des deuterojesajanischen Buches* (1907); *Einleitung in das Alte Testament* (1910); *Der alt-testamentliche Prophetismus* (1912); *Jericho* (1913).

SELLING, zĕl′ĭng, EDUARD (1834–). A German mathematician. He was born in Ansbach and was educated at Munich and Göttingen. From 1860 to his retirement in 1906 he was professor of mathematics in the University of Würzburg. He contributed to mathematical and medical journals articles on pure mathematics and on questions relating to insurance, and devised two calculating machines (1887 and 1905).

SEL′MA. A city and the county seat of Dallas Co., Ala., 50 miles west of Montgomery, on the Alabama River, which is navigable to this point all the year, and on the Southern, the Western of Alabama, the Louisville and Nashville and their several various tributary-leased railroads (Map: Alabama, C 3). It has Dallas Academy, the Alabama Methodist Orphanage, a Carnegie library, and the Alabama Baptist Colored University (opened in 1878). Noteworthy are the courthouse, Y. M. C. A. building, and the Alabama River bridge. Selma is the centre of a region engaged in cotton growing, farming, and cattle raising, has important wholesale and jobbing interests, and is of considerable industrial importance. Repair shops of the Southern Railway, cotton mills and cotton gins, a large grist mill, foundries and machine shops, and manufactories of cottonseed oil, engines and boilers, machinery, wagons, bricks, candy, spokes, fertilizer, and boxes are among the leading establishments. The government is vested in a mayor and a unicameral council. During the Civil War Selma was an important military depot for the Confederacy. On April 2, 1865, after a sharp engagement, the garrison surrendered to a Federal army under Gen. J. H. Wilson. Pop., 1900, 8713; 1910, 13,649; 1915 (U. S. est.), 15,307; 1920, 15,589.

SELOUS, se-lōō′, FREDERICK COURTENEY (1851–1917). An English hunter and explorer in South Africa. He was educated at Rugby and on the Continent. In 1871 he went to South Africa, where for 19 years he was almost continuously in the field, hunting chiefly elephants and earning his living by selling ivory and natural-history collections. In 1890 he piloted the pioneer expedition of the British South Africa Company through Mashonaland, and he was prominent in the events that brought about the occupancy of all the large territory north of the South African Republic. In 1893 he participated in the first Matabele War. After that time he lived in Surrey, England. His publications include: *A Hunter's Wanderings in Africa* (1881; new ed., 1907); *Travel and Adventure in Southeast Africa* (1893); *Sunshine and Storm in Rhodesia* (1896); *Sport and Travel, East and West* (1900); *Recent Hunting Trips in British North America* (1907); *African Nature Notes and Reminiscences* (1908).

SELTERS WATER. A mineral water obtained at Selters, near Limburg in Nassau, Germany. The spring has a high reputation for its medicinal qualities in chronic disorders of the digestive and respiratory organs. It is a sparkling alkaline water containing sodium carbonate and common salt. A mineral water of the same composition is now extensively manufactured in Europe and in the United States. Selters is incorrectly called seltzer in the United States.

SELUNGS′. The inhabitants of the Mergui Archipelago in the eastern part of the Bay of Bengal, off the coast of Tenasserim; a primitive, seafaring people of doubtful ethnological relations. They are probably the original population of Burma. Consult Anderson, *The Selungs* (London, 1890), and Sir J. G. Scott, *Burma: Handbook of Practical Information* (ib., 1906).

SELVAGE. See KNOTTING AND SPLICING.

SELWYN, sĕl′wĭn, ALFRED RICHARD CECIL (1824–1902). A British geologist, much of whose life was spent in Canada. He was born at Kilmington, Somerset, was educated chiefly by private tutors in England and Switzerland, and in 1845 was appointed assistant geologist on the Geological Survey of Great Britain. From 1852 to 1869 he was director of the Geological Survey of Victoria, Australia. He also made a study of the coal and gold fields of Tasmania and South Australia and in 1856 was a Victorian commissioner of mines. He was director of the Canada Geological Survey from 1869 to 1894, when he was retired and pensioned. In 1896 he was president of the Royal Society of Canada. He published large contributions to the *Geological and Natural History Survey of Canada* (19 vols., 1869–94), of which work he was the editor.

SELWYN, GEORGE AUGUSTUS (1719–91). An English wit. He studied at Eton with Gray and Walpole and at Oxford, and from 1747 till 1780 sat in Parliament. In the meantime he had succeeded to the family estates (1751) and had obtained several sinecures, as registrar of the Court of Chancery in Barbados and surveyor-general of the works. He became a member of the leading London clubs, where he was known as "Bosky" and was popular in society. Selwyn had a peculiar fondness for witnessing the execution of criminals. As was inevitable, his witticisms lost their flavor when the incidents that inspired them were forgotten. Consult: J. H. Jesse, *Selwyn and his Contemporaries* (new ed., London, 1882); Roscoe and Clergue (eds.), *Selwyn: His Letters and his Life* (New York, 1900); S. P. Kerr, *George Selwyn and the Wits* (London, 1909).

SELWYN, GEORGE AUGUSTUS (1809–78). A missionary and the first and last Anglican Bishop of New Zealand, born at Church Row, Hampstead. He took his degree at St. John's College, Cambridge, in 1831. In 1841 he was consecrated Bishop of New Zealand and labored there till 1867, when he became Bishop of Lichfield. He

displayed great ability as an organizer, both in the mission field and at home. Selwyn College, Cambridge, was erected in his memory in 1882 by popular subscription. His works include: *Are Cathedral Institutions Useless?* (1838); *Letters to the Society for the Propagation of the Gospel, etc.* (1843–44); *Verbal Analysis of the Holy Bible* (1855). Consult: H. W. Tucker, *Memoir of the Life and Episcopate of George Augustus Selwyn* (2 vols., London, 1879); G. H. Curteis, *Bishop Selwyn of New Zealand and of Lichfield* (ib., 1889); E. A. Bulley, *George Augustus Selwyn, First Bishop of New Zealand* (ib., 1909).

SELWYN COLLEGE. See CAMBRIDGE, UNIVERSITY OF.

SEMANG', or MENDI. One of the aboriginal peoples of the Malay Peninsula, inhabiting northern Perak, Kedah, Rahman, Ranga, and Kelantan. They are short-statured and darker than the Sakai (q.v.), from whom they are also distinguished by their curly hair. They are a nomadic hunting people. Consult Wilkinson, *The Peninsula Malays* (London, 1906).

SEMAN'TICS. See SEMASIOLOGY.

SEM'APHORE. A town and seaside resort on the Gulf of St. Vincent, South Australia, about 10 miles from Adelaide by rail. Pop., 1911, 8960.

SEMAPHORE. See BLOCK-SIGNAL SYSTEM; SIGNALING AND TELEGRAPHY, MILITARY; SIGNALS, MARINE; STORM AND WEATHER SIGNALS.

SEMA'SIOL'OGY (from Gk. *σημασία, sēmasia*, signification + *-λογία, logia*, account, from *λέγειν, legein*, to speak), or SEMANTICS. The study which treats of the development of the meanings of words. Thus, the Latin *altus* signifies both "high" and "deep," according to the position of view, whether the observer regards the situation from below or from above. Again, the force of the verb *bless*, which is employed euphemistically in several languages to denote also to *curse* (like *bless* in colloquial English), receives a semasiological explanation as a euphemism. The atmosphere of a word is constantly subject to change, owing to such external circumstances, and it is familiarly recognized that analogous conditions will call forth parallel developments in the meaning. Thus, English *heathen*, from Anglo-Saxon *hæþen*, originally denoted "belonging to the heath," or inhabitant of the district remote from civilization and Christianity, hence "unbeliever." In like manner *pagan*, from Latin *paganus*, originally signified a dweller in an outlying district (*pagus*) and thus acquired the force of "ungodly." Simile and metaphor, alternation between the abstract and concrete, analogy and differentiation, tendencies to generalization and particularization, to expansion and restriction, elevation and degradation in meaning, are among the many forces which come into play in determining the significance of a word in its changes in connotation.

Bibliography. Arsène Darmesteter, *La vie des mots* (4th ed., Paris, 1893); Hans Oertel, *Lectures on the Study of Language* (New York, 1902); Welby, *What is Meaning? Studies in the Development of Significance* (London, 1903); Hermann Paul, *Prinzipien der Sprachgeschichte* (4th ed., Halle, 1909); Nyrop, *Grammaire historique de la langue française*, vol. iv (Paris, 1913); Michel Bréal, *Essai sémantique* (5th ed., ib., 1913; Eng. trans. of 3d ed. by Mrs. Cust, London, 1900); Leonard Bloomfield, *Introduction to the Study of Language* (New York, 1914).

SEMBACH, zĕm'bäĸ, JOHANNES (1881–). A German dramatic tenor, born in Berlin. Upon completing the course at the Berlin Gymnasium he was about to choose the career of an orchestral conductor when the fine quality of his voice was discovered. He began his vocal studies under Felix Schmidt, of Berlin, and then continued under Rothmühl at Stern's Conservatory. When Mahler heard him in 1903, he engaged him for four years at the Royal Opera in Vienna. From 1907 to 1913 he was a member of the Royal Opera at Dresden, where he created a number of parts. In 1911 he spent a year and a half with Jean de Reszke (q.v.) in Paris. His début at the Metropolitan Opera House in 1914 as Parsifal was one of the greatest successes ever achieved by a tenor. Before the season was over it was generally admitted that the Wagnerian heroes had had no such interpreter since the days of De Reszke. In beauty of voice and in its artistic use Sembach surpassed all German tenors previously heard in the United States, while his histrionic ability equals that of the famous Alvary. His art has much in common with that of De Reszke.

SEMBAT, sän'bȧ', MARCEL (1862–1922). A French Socialist statesman and editor, born at Bonnières, Seine-et-Oise. He was educated at the Collège Stanislas of Paris and became a doctor of laws. For many years he was closely associated with Jean Jaurès (q.v.) and after 1893 was a member of the Chamber of Deputies, where he sat with the Socialist group. Sembat was editor in chief of the *Petite République*, wrote for *La Lanterne*, and then became an editor of *L'Humanité*. After the European War broke out in 1914 Sembat was Minister of Public Works in Viviani's coalition cabinet and then in that of Briand. He is author of *Faites un roi sinon faites la paix* (17th ed., 1913).

SEMBRICH, zĕm'brĭĸ, MARCELLA (1858–). A Polish operatic soprano, born at Wisniowczyk, Galicia. Her real name was Praxede Marcelline Kochanska, and she received her musical education under Wilhelm Stengel (who subsequently became her husband) and Epstein and Rokitansky at Vienna. Her début (1877) occurred at Athens in *I Puritani*, and she subsequently studied German opera under Richter and Lewy at Vienna. After an 18 months' engagement at the Dresden Court Theatre she went to London, where from 1880 to 1885 she was one of the prima donnas of the London opera, in the intervals making many successful tours in both Europe and America. In 1889 she returned to Dresden, in which city she made her permanent home. She became widely known for her remarkably pure soprano and her brilliant coloratura coupled with rare interpretative power and a charming presence. She retired from the operatic stage in 1909, while still in the fullness of her vocal powers, but continued to appear in recitals. As president of the American Polish Relief Committee in 1915, she devoted herself untiringly to the interests of her native land, stricken in the European War.

SEMÉ, se-mȧ' (Fr., sown). In heraldry (q.v.), a term used to describe a shield bearing a charge repeated an indefinite number of times. It is then said to be semé of or with that charge, as semé of fleur-de-lis.

SEMELE, sĕm'ĕ-lē (Lat., from Gk. Σεμέλη). The daughter of Cadmus and mother of Bacchus (q.v).

SEMEN'DRIA. A Servian fortress on the

right bank of the Danube, 30 miles southeast of Belgrade (Map: Balkan Peninsula, C 2). An ancient triangular fortification, said to have been built in 1430, it is a noteworthy feature of the town. The inhabitants are employed principally in wine culture. Pop., about 7000. Semendria was at one time the seat of the Servian kings. In 1411 the Turks gained here a splendid victory over the Hungarians. It was captured by the Teutonic allies in 1915. See WAR IN EUROPE.

SEMENOV, sĕm-yą′nôf, PETER PETROVITCH (1827–1906). A Russian geographer and traveler, born in St. Petersburg and educated there and in Berlin. He traveled extensively in western Europe and in 1857 made a great expedition through Central Asia to the Tian Shan Mountains, where Mount Semenov and the Semenov Glacier bear his name. He explored the upper course of the Syr Darya and also made important discoveries in Transcaspia. Semenov's travels were described in *Petermanns Mitteilungen* (1886) and in the *Zeitschrift* of the Berlin Geographical Society (1869). In the emancipation of the serfs he was officially prominent. In 1864 he became director of the Bureau of Statistics and in 1897 a member of the Council of the Empire. From 1899 he was editor of the *Rossiya*, a geographical description of Russia.

SEMENOVKA, sĕ′myĕ-nôf′kȧ. A town in the Government of Tchernigov, Russia, about 70 miles northeast of Tchernigov. It produces hides, skins, boots, and oil and trades in bristles. Pop., 1897, 15,125; 1910, 18,501.

SEMES′TER (Lat. *semestris, sex* + *mensis,* a period of six months). A term used to denote the half-yearly division of the college or university year, the original expression being *semestris cursus* (six months' course). This division is employed universally in Germany and usually in the colleges and universities of America. The duration of a semester varies from 15 to 18 weeks. A notable exception to this practice of dividing the college year into halves is the University of Chicago, which has four quarters of approximately 12 weeks each. In England the university year consists of three terms of approximately three months each.

SEMIANTHRACITE (sĕm′ī-ăn′thrȧ-sīt) **COAL.** See COAL.

SEMIAUTOMATIC GUNS. See RAPID-FIRE GUN.

SEMIBREVE, sĕm′ī-brēv′ (It., *semibreve,* half short, from *semi-,* Lat. *semi-,* half + *breve,* Lat. *brevis,* short). In music, a note of half the duration of the breve (q.v.) of old ecclesiastical music, but the longest note in use in modern music. It is popularly known as a whole note, is represented by a character circular or elliptical in form , and is adopted as the integer or measure note, the other notes—minim, crotchet, quaver, etc.—being proportional parts of it. In mensurable music (q.v.) it was the fourth in value, one-quarter of a large.

SEMINAR, sĕm′ī-năr′ (Ger. *Seminar,* from Lat. *seminarium,* seed plot, from *semen,* seed, from *serere,* to sow; connected with Eng. *seed*). A name applied to certain courses given in German and American universities. They consist of research work carried on by the students under the direction of the professor. Seminars are offered in scientific and scholastic fields affording material for the investigator. The members of the seminar meet at various times for the discussion of reports on special research conducted by one of their number. The seminar originated in the universities of Halle and Göttingen. The first were in philology and aimed to prepare teachers for the classical schools. Johns Hopkins University and other American universities generally have now introduced seminars. The character of the work done in the American seminars varies greatly in the several universities, ranging from mere reports to original contributions. Consult Perry, "The American University," in Butler, *Education in the United States* (Albany, 1900).

SEM′INOLE (properly *Simanoli,* separatist, runaway). A tribe of Muskhogean stock (q.v.), formerly residing in Florida and celebrated for the determined resistance which they maintained for seven years against the efforts of the United States government to remove them from their homes. They were originally a part of the Creeks (q.v.), chiefly of the Hichitee or southeastern division, and, as the name implies, separated from the main confederacy and overran the peninsula after it had been depopulated by the destruction or deportation of the Apalachee and Timucua (q.v.) by the English in 1702–03. They also received accessions from the kindred Yamassee, who had been driven out of Carolina by the English in 1715, and had also a considerable negro element from runaway slaves. In the early period they were frequently classed with the Lower Creeks, but they became recognized as a distinct tribe about the beginning of the Revolution. In the first part of the nineteenth century they had about 20 towns, the most important being Mikasuki and Tallahassee. The people of Mikasuki were known as the Red Stick Indians, from their custom of setting up a pole painted red as a war emblem, and were considered the leaders in every warlike enterprise. In 1817–18 (Florida being then Spanish territory) they came into conflict with the Americans and their country was invaded by General Jackson, who destroyed their principal towns, hung the two English traders (Arbuthnot and Ambrister) who had instigated the trouble, and ultimately brought about the cession of Florida to the United States in 1819. By the Treaty of Payne's Landing in 1832 they were pledged to remove to the west of the Mississippi, but the treaty was repudiated by a considerable part of the tribe under the leadership of the young chief, Osceola (q.v.), the result being the most desperate and costly Indian war in the history of the government. It began with the surprise and massacre of Major Dade's entire command of 100 men on Dec. 28, 1835, and continued until 1842, resulting in the loss of thousands of lives and the expenditure of $10,000,000. In the end the Indians were conquered and removed to Oklahoma, with the exception of a few hundred who remained in Florida.

Those removed to Oklahoma and their descendants constitute the Seminole nation and formerly had a government organized upon the general plan existing among the others of the Five Civilized Tribes, viz., Cherokee, Creek, Choctaw, and Chickasaw. They came under agreement for individual allotment of their tribal lands and absorption into American citizenship in 1906. The number of "citizens" of the Seminole nation officially reported in 1910 was 1509. Those in Florida are in the Everglade region in the southern portion of the peninsula. They refuse to mingle with the whites and retain most of their primitive customs. As they have

no title to their lands and the Everglades are being drained, the government has taken steps to secure for them a small reservation. Consult MacCauley, in *Bureau of American Ethnology, Fifth Annual Report* (Washington, 1887), and M. M. Wilson, *The Seminoles of Florida* (New York, 1910). See CREEKS.

SEM'IONO'TUS (Neo-Lat., from Gk. *σημεῖον, sēmeion*, sign + *νῶτον, nōton*, back). A genus of ganoid fishes, the fossil remains of which are found in the Triassic rocks of Europe, America, and South Africa. *Lepidotus* is an allied genus, also occurring in the Trias.

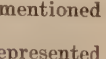
SEMIPALATINSK, sā'mē-pā-lā-tyĕnsk'. A territory of Russian Central Asia forming an administrative division of the governor-generalship of the Steppes (Map: Asia, K 3). Its area is 184,626 square miles, including 6310 square miles of lakes. In the north it is the continuation of the great Siberian plain. The southeastern part belongs to the region of the Altai Mountains, and other chains cover the southwestern part. There are extensive valleys between the chains. The principal river is the Irtysh, which is navigable through its entire course in the territory. The largest lake is Saisan, about 80 miles long and from 10 to 20 miles wide. There are also numerous lakes along the Irtysh and in the mountains, and Lake Balkhash touches the territory on the southwest. Gold, silver, lead, copper, graphite, and coal are the principal minerals. The climate is very severe. The winters are characterized by extreme cold and fearful snowstorms, while the summers are very hot, the mean temperature ranging from 72° F. for July to 5° F. for January. The precipitation is scanty, and only in a small part of the territory can agriculture be carried on without irrigation, which is being gradually introduced. Agriculture is the principal occupation of the settled and of a part of the nomadic population and is gradually increasing in importance. The principal agricultural products are wheat and oats. The nomadic Kirghizes, who form the bulk of the population, are engaged chiefly in stock raising. Some of the lakes yield considerable quantities of salt. Pop., 1913, 862,000. The Mohammedans number over 550,000.

SEMIPALATINSK. The capital of the Russian Province of Semipalatinsk in Central Asia, on the right bank of the Irtysh, 2290 miles east-southeast of Moscow (Map: Asia, K 3). It has a library, a museum, and a number of mosques. In the vicinity are Tungus ruins with religious inscriptions. The principal products are tallow and leather. Pop., 1909, 35,121.

SEM'I-PELA'GIANISM. A late designation of a Western heresy of the fifth and sixth centuries, akin to Pelagianism (q.v.). Although Pelagianism itself had been condemned, not a few Christians endeavored to hold an intermediate position between the doctrine of Augustine (q.v.), with its accompaniments of original sin, natural depravity, and efficacious grace, on the one hand, and the rather superficial moral-ability theory of Pelagius, on the other. It has been justly observed that these mediators might with almost equal propriety have been called Semi-Augustinians. Augustine held that right choice was only because of God's irresistible grace; Pelagius, that man's choice is from his own free will, though God's grace later assists him. The Semi-Pelagians held that God's grace and man's free will coöperate in redemption; that Adam's sin did not destroy all ability to seek the good, although it greatly weakened it; that every one may be saved, if he will. Predestination is not unconditional, but depends upon God's foreknowledge. These views first appear in Africa, among the monks, but their great centre was Massilia (Marseilles) in southern Gaul, whence their advocates were called Massilians. Chief among them were John Cassian (died c.435), Vincent of Lerins (died c.450), and somewhat later Faustus of Riez (died 492), all of whom held positions of honor and influence in the Church. They are typical of the many who highly esteemed St. Augustine, but could not bring themselves to accept the logical consequences of his theology.

The beginnings of Semi-Pelagianism were observed as early as 428–429 by Prosper of Aquitania and by him reported to Augustine with the request that he would lift his voice and pen in opposition. This he did willingly enough in his two works *On the Predestination of the Saints* and *On Perseverance*. Prosper also appealed for aid to Celestine, Bishop of Rome, and the latter promptly issued a letter to the clergy of Gaul rebuking their dangerous speculations. Among later opponents of Semi-Pelagianism were Avitus of Vienne (died c.525), Fulgentius of Ruspe (died 533), and Cæsarius of Arles (died 543). The controversy is usually regarded as terminated by the adverse decisions of the Synod of Orange (529), over which Cæsarius presided. Its decrees were soon afterward confirmed by Pope Boniface II.

Subsequent doctrinal history exhibits a wavering of opinion as to the relative value of the two opposing systems associated with the names of Augustine and Pelagius. In the ninth century Rabanus Maurus and Hincmar of Rheims maintained the Semi-Pelagian view against the thoroughgoing predestinarianism of Gottschalk and secured his condemnation by synods at Quierzy (849) and Valence (855). The schoolmen and the mendicant orders carried on the debate with great warmth. In the seventeenth century the Jansenists were vigorously opposed by the Jesuits for reviving so-called Augustinianism, which by that time had become almost obsolete. Among Protestants Melanchthon showed Semi-Pelagian leanings, whence developed the bitter Synergistic controversy (see SYNERGISM), while the Dutch Arminians illustrate a similar conflict of opinion among Calvinists. See ARMINIANISM. Consult Adolf Harnack, *History of Dogma*, vol. v (Eng. trans., Boston, 1899); Knöpfler and others, *Zur Dogmengeschichte des Semipelagianismus* (Münster, 1899); Robert Rainy, *The Ancient Catholic Church*, vol. i (New York, 1902); William Bright, *The Age of the Fathers*, vol. ii (London, 1903). Consult also the literature cited under PELAGIUS, and see the articles on the advocates and opponents of Semi-Pelagianism mentioned in this article.

SEM'IQUA'VER. A musical note, represented thus, or in groups thus,  equivalent in value to $\frac{1}{16}$ of a semibreve, or whole note. The *Practica Musicæ* of Gafurius (Milan, 1496) contains the earliest mention of the semiquaver.

SEMIRAMIDE, sā-mē'rā-mē'dā. An opera by Rossini (q.v.), first produced in Venice, Feb. 2, 1823; in the United States, April 29, 1835 (New York).

SEMIR'AMIS. A legendary queen of Assyria. According to Ctesias (in *Diodorus Siculus*, II, i), she was daughter of the Syrian goddess Derceto (of Ascalon), was exposed as an infant, but was miraculously saved by doves, and became the wife of one of the chief officials and generals of Ninus, King of Assyria and founder of Nineveh. She accompanied her husband on a campaign against Balkh and by her ingenuity and daring captured the city. This exploit won the notice of the King, and, captivated by her charms, he demanded her from her husband. The latter committed suicide. Semiramis married Ninus, bore him a son, Ninyas, and ruled as Regent after the King's death. She founded Babylon and built the city in its full splendor. She conquered Persia, Egypt, Libya, and Ethiopia and invaded India, but there was defeated and wounded in personal combat with the King Stabrobates. Wherever she went she was said to have built cities and to have constructed great works. Ultimately her son plotted against her, and she disappeared in the sixty-second year of her age and forty-second of her reign. Tradition said she was changed into a dove and became a deity. She is represented as of sensuous character. The story is evidently an epitome of Assyrian history hung upon the names of Ninus and Semiramis. According to Herodotus (i, 184), there was a Semiramis Queen of Babylonia in the first half of the eighth century B.C. A governor of Calah erected a statue of the god Nebo to secure long life for Adadnirari V (812–783), his lord, and Sammuramat, the lady of the palace, his mistress, as well as for himself. It has been thought that this Sammuramat of history grew into the Semiramis of legend. Consult Alfred Jeremias, *Das Alte Testament im Lichte des alten Orients* (Leipzig, 1906).

SEMIRYETCHENSK, sâ-mē-ryĕ-chĕnsk'. A territory of Russia in Central Asia, belonging administratively to the governor-generalship of Russian Turkestan. Area, over 145,000 square miles (Map: Asia, J 4). It is divided according to the formation of its surface into two parts, of which the southeastern is mountainous, being traversed by offshoots of the Tian Shan Mountains (q.v.), and the northwestern belongs to the region of the Siberian steppes. The rivers rise mostly in the Tian Shan Mountains and flow into Lake Balkhash. The chief of them is the Ili, which is also the principal navigable waterway of the territory. The principal lakes are Balkhash (q.v.) and Issyk-kul (q.v.). The climate is continental. The winter is extremely cold, and the summer, which follows a brief spring, is hot and dry. In the mountainous portions are found gold, salt, and alabaster. Much of the lower part of the territory is fertile agricultural land which becomes very productive when irrigated. The crops in the northwest consist mainly of wheat, oats, and oleaginous plants. Agriculture, however, is as yet of secondary importance, as the nomadic Kirghizes, the predominating element of the population, are engaged almost exclusively in stock raising. Pop., 1912, 1,239,200, of whom the Kirghizes constitute three-fourths. Capital, Vyerny (q.v.).

SEMITES, sĕm'īts. A name used to designate a certain group of peoples whose close kinship is revealed by many physical and mental characteristics, but especially by language and religion. The term is derived from the table of nations in Gen. x, in which the eponym heroes of some Mediterranean peoples known to the authors are represented as descendants of the three sons of Noah, Shem, Ham, and Japheth (qq.v.). But, as a matter of fact, all the nations here grouped under Shem are not akin; some of the peoples arranged under Ham are evidently kinsmen of the leading nations reckoned as descendants of Shem, and some peoples are mentioned under both Shem and Ham. Historical and geographical reasons seem to some extent to have prevailed in the arrangement. But, in spite of the inexact classification in Gen. x, the term Semites has been retained for the sake of convenience in preference to other designations which have been proposed, such as Syro-Arabians or simply Arabs. As it is now used, it indicates Akkadians, Assyrians, Chaldæans, Gutians, and Lulubians; Phœnicians, Carthaginians, and Amorites; Israelites, Edomites, Moabites, and Ammonites; Aramæans; Arabians and Ethiopians.

As to the original home of these Semitic peoples there is a preponderance of opinion in favor of Arabia or Africa. The idea of a Babylonian origin has indeed been revived in recent times. Certain customs, possessions, and achievements of the early Egyptians exhibit a marked similarity to those of their contemporaries in Babylonia, and some scholars have tried to explain the introduction of metals, domestic animals, a peculiar mode of burial, and the use of brick in a land where stone is found in plenty, by the immigration into the Nile valley of a Semitic race that once lived in Babylonia. Closer examination, however, has shown the identity of the neolithic race in Egypt with the dynastic Egyptians. The close affinity ethnologically between the Egyptians and the other so-called Hamitic peoples, such as the Libyans, the Berbers, the Cushites, the Gallas, the Danakils, and the Somali, renders it improbable that the Egyptians were immigrants from Asia. Nevertheless, the kinship of the North African languages with Semitic speech is unmistakably shown in numerals and prepositions, noun formation and verb inflection, syntax, and morphology. (See SEMITIC LANGUAGES.) Some scholars have therefore drawn the conclusion that the Semites are likely to have lived originally in Africa, though not as differentiated Semites, and to have crossed into Arabia by Bab el Mandeb or Suez, where in new surroundings and seclusion their characteristic peculiarities may have developed. From Arabia succeeding waves of emigration sent Semitic nomads into Babylonia, Mesopotamia, and Syria. (See ARABIA.) Invasions of Babylonia must have occurred very early, since already in the fifth millennium B.C. the influence of Semitic speech is seen in the Sumerian language (q.v.). It is impossible to date with certainty the invasion of Syria, but there is a tradition that brings the foundation of some Phœnician cities back to the first half of the third millennium B.C. (see PHŒNICIA), and there is no reason to doubt that Palestine attracted the Semitic nomads even at an earlier time. How soon the tribes subsequently developing into the nations of Israel, Judah, Edom, Moab, and Ammon drifted into Syria cannot be determined. Some passages in the Amarna letters written about 1400 B.C. mentioning the *Habiri*, probably a cuneiform equivalent of *'Ibiri* (Hebrews), seem to refer to them. (See HEBREWS; JEWS.) Aramæans had settled in Mesopotamia and Babylonia at least as early as the thirteenth century

B.C., and Chaldæans are found in the neighborhood of the Persian Gulf not much later. (See ARAMÆANS; CHALDÆANS.) Semites speaking a decidedly Sabæan dialect seem to have lived in Abyssinia in the seventh century B.C. and probably long before that time. See ETHIOPIA.

The Semites belong to the white Caucasian race. Physically the Semitic type has probably maintained itself most pure in Arabia. In Babylonia it is likely to have been modified by the Sumerians, in Assyria by the Hittites, in Mesopotamia by the Mitannians and Hittites, in Syria by the non-Semitic aborigines, in Abyssinia by Hamitic tribes, in Carthage by the Berbers. During the period of the caliphs the Arabs in the conquered lands intermarried with the nations and the mixture of blood was increased by the harem life. Nevertheless, there are certain unmistakable physical characteristics of the Semitic race, such as a tendency to prognathism, fullness of lip, an aquiline nose, and wavy or curly hair.

It is widely held that the Semitic mind is analytical rather than synthetical, practical rather than speculative, inclined to occupy itself with details rather than generalizations; that the race excels in commerce and industry rather than in warfare and statecraft, in morals and religion rather than in science and art. In the main this estimate is probably fair. There are not wanting scholars, however, who look upon it as a one-sided characterization. In order to reach a comprehensive and well-balanced judgment their arguments must be given due attention. The fact that Semitic speech avoids the formation of compounds is no doubt a most significant indication of an analytical rather than synthetical tendency; and the marked capacity for keen analysis coupled with a striking inability to systematize knowledge, seen in the Arabic philosophers not less than in the Talmud, is in harmony with this. Nevertheless, there is force in the argument that three monotheistic religions created by this race indicate a deep sense of unity and a remarkable power of synthesis. It should be observed, however, that monotheism with the Semites is not so much a result of processes of ratiocination as of the concentration of worship upon one god. The correctness of ascribing to them a certain sober, matter-of-fact way of reasoning may not be seriously questioned on the ground of allegorizing common among Hellenistic Jews, the curious flights of cabalists from the solid ground of reality, or the speculations of some Arabic and Jewish philosophers of the Middle Ages, since in these instances it is necessary to reckon largely with infusions of foreign blood and foreign thought. To what extent the mythical lore of Babylonia was the creation of Semites and not of their predecessors, the Sumerians (see SUMERIAN LANGUAGE), is difficult to determine. Our most prolific sources do not reveal the wealth of myths once no doubt flourishing in Syria and Arabia; they are late and are written either from the standpoint of monotheism interested in the suppression or transformation of the myths, or from the standpoint of rationalism interested in translating them into history. Much weight must be attached to the peculiar idealism that so often manifests itself among the Semites in prophetic enthusiasm and devotion to lofty aims promising no immediate returns. It is indeed to be observed that the prophetic outlook is most sober where it is least affected by foreign movements of thought; and it cannot be denied that the cases of love of the ideal for its own sake become more striking by contrast with the prevailing devotion to a cause because of the tangible reward it will bring.

To the growth of political life the contributions of the Semite do not appear to have been very great. His attitude is that of the Orient as distinct from the Occident, and there is less difference between him and the Persian than between the Persians and their kinsmen the Greeks. The superiority of the Semite as a trader is not wholly due either to a survival of nomadic habits or to the social conditions of an exile from home not permitted to engage in agriculture. Cuneiform inscriptions reveal an extraordinary development of commercial relations, including banking, contracts, deeds, bookkeeping, and the like, in ancient Babylonia among a settled people whose land was carefully cultivated. Such peoples as the Aramæans settled in Mesopotamia; the Yemenites, the Edomites, and the Phœnicians were great traders. From Carthage Rome secured her textbooks on agriculture, yet Carthage was even more famous for her commerce. No doubt the heaviest debt that science owes to the Semites is for faithful transmission of knowledge originally won by others. Babylonians, Aramæans, Arabs, and Jews have done yeoman service as intellectual brokers. It should not be questioned, however, that they have added not a little to the precious burdens they have carried down the ages, especially in astronomy, mathematics, chemistry, anatomy, and philology. At least one Arabic historian, Ibn Khaldun, deserves to be ranked with the great interpreters of history in any age.

To what extent religious protests against images prevented a normal development of native capacities for the plastic arts cannot be known. The statues found at Telloh Bismaya and elsewhere cannot be claimed for the Semites. They give the impression of being the ripe fruits of a long growth among the Sumerians. The representations of Naram Sin (q.v.), the Akkadian, are indeed excellent, but it is not known how far they may be due to Sumerian influences. The Assyrians certainly excelled in the representation of animals, but do not seem to have developed otherwise a high artistic taste. The representations of the human figure on South Arabian monuments are exceedingly crude. It is chiefly in the arabesque, based upon mathematical motives, that the Semitic art achieved a distinct triumph. There is reason to suppose that music may have reached a comparatively high degree of development among the ancient Semites. Unfortunately it is not possible to determine its exact character. The Semitic race has never produced a great drama or epic poem. But the Semite excels in lyric poetry. The finest examples are the Book of Job (q.v.) and the poems of Heine (q.v.), though the Psalms, Canticles, and the Muallakat furnish some passages of genuine inspiration. This tendency also created an elevated prose or semipoetry found in oracles, as in the prophetic writings and the Koran, often with a definite metre and a simple rhyme. There have been great philosophers among the Semites, such as Philo, Ibn Gabirol, Maimonides, Spinoza, Avicenna, and Averroes, but their contributions are indicative of the influence of foreign speculation rather than representative of native tendencies of thought, finding expression through these men of genius.

On the other hand, it may be questioned whether the sense for conduct and the genius for religion accredited to the Semites have not to some extent been exaggerated. It is true that so early a production as the Code of Hammurapi (q.v.) exhibits surprisingly advanced ethical conceptions, but it is now known that to some extent at least it is a codification of Sumerian law. The legislative codes of Israel, especially Deuteronomy (q.v.), show much concern for the poor, the weak, and the slaves and seek to safeguard the sanctity of the family, and the commentaries on the Law in the Mishna and the two Talmuds reveal a sturdy moral sense endeavoring to apply the Law to the various conditions of life without making the burdens too heavy. The great prophets put the emphasis very strongly on the moral requirements, equity, justice, and mercy. In their spirit Jesus gave paramount importance to the inner disposition and made love the fulfillment of the law. South Arabian inscriptions show a deeper consciousness of sin as well as a keener religious sense in general than the secular songs of a late syncretistic period had led men to expect. And the moral earnestness of Mohammed himself and many followers of this prophet must be recognized. But no Semitic people ever conceived of such a marvelous adjustment of character and destiny as the Indian doctrine of metempsychosis presents. The emphasis upon truthfulness seems stronger among the Persians, and the search for truth among the Greeks. The uncompromising rectitude of spirit that led the Teuton to involve Odin himself in the twilight of the gods because of his moral delinquencies is only approached in the Book of Job. Yahwe may repent of what he has done, but he is not punished for his errors. Without the impact of ideas essentially foreign to his native modes of thought, and recognized as such by his kindred, no Semite has ever risen to the conception of moral autonomy. The question why one course of action should be preferred to another has been universally answered by the Semite by reference to a law imposed from without. This dependence upon an external authority for a standard of right has no doubt strengthened the religious feeling. Another cause of religious fervor has been sought in the institution of polyandry which apparently prevailed among the early Semites to a greater extent than among any equally gifted race, and continued, long after another type of marriage had taken its place, to exercise its influence in the worship of a mother goddess who freely gives herself even to human lovers. A religious mysticism ultimately based upon such a conception of sexual relationship poured a wealth of tenderness and devotion into the worship of the supreme tribal god and remained an important factor long after the mother-goddess cult had ceased. That the Semite possesses a capacity for intense religious faith is manifest; the name of Jesus would alone prove this. He was preceded and followed by many prophets in Israel; and Mohammed is not the only important witness to the power of the religious feeling in the home of all the Semites. The fact that monotheism was reached by Jews and Arabs, not by reasoning, but by faith in and devotion to the tribal god, is itself a testimony to the hold religion had on these people. Nevertheless, it is impossible to escape the impression that neither the consciousness of the unity of the divine life, nor the sense of mystic union with the divine, nor the devotion to a divinely ordained mode of life, was ever so universal or so intense among the Semites as it has been in India. If the Semites are to us the people of religion par excellence, it is because through the prophets of Israel, and preëminently through the founder of Christianity, a form of religion has found its way into the world which, independent of cultic performances and changing intellectual apperceptions, presents high ethical motives and ideals touched with a sense of the infinite mystery and sacredness of life.

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SEMITIC LANGUAGES. The current designation of a group of languages sharply marked off from other groups by certain characteristic features pertaining both to morphology and to lexicography. The name Semitic is an unfortunate one, derived from the classification of nations in the tenth chapter of Genesis. (See SEMITES.) In retaining it we must not only bear in mind that it is a purely conventional designation for a certain group of languages, but also distinguish between its ethnic and linguistic applications. It does not follow that nations speaking the same languages belong necessarily to the same stock.

Confining ourselves to the linguistic application, we may distinguish two chief branches of Semitic speech—a northern and a southern. To the northern branch belong (1) the Babylono-Assyrian; (2) the Aramaic, subdivided into a western and an eastern branch (see ARAMAIC); (3) Hebræo-Phœnician. To the southern branch belong (1) the Arabic, which again is divided into North and South Arabic, and (2) Ethiopic.

In comparison with the territory throughout which the Indo-Germanic languages are spoken the area of Semitic speech is exceedingly limited. Excluding the modern Hebrew and modern Arabic, which have been carried by Jews and Arabs to distant parts, the Mediterranean and the Euphrates, the Indian Ocean and the Taurus Range represent the western, eastern, southern, and northern boundaries for the groups of Semitic languages. As a direct consequence of these narrow confines, the relationship of the various Semitic languages to one another is much closer than is the case with the various Aryan groups (e.g., Persian and Teutonic); it is almost justifiable to call them dialects rather than separate languages.

The chief traits characterizing the Semitic languages are: (1) within the historical period

of the languages, the triliteral character of most of the stems underlying both nouns and verbs; (2) in the morphology, the constant character of the consonants forming the stems, the vowels being used to indicate the variations on the main theme; (3) substantial agreement in the noun and verb formation; (4) the arrested development in the expression of time relation in the case of the verb, which does not pass clearly beyond the differentiation between a completed and an incompleted act; (5) the use of certain consonants in all the languages (particularly *h*, *n*, *sh*, *t*) for pronominal prefixes and suffixes and for indication of plural and feminine, as well as variations of the verbal stem corresponding in a measure to modes in Indo-Germanic languages. Other traits might be mentioned, such as the paucity of auxiliary particles, more particularly conjunctions; and it should be noted that while the Semitic languages agree closely in having the same words for common terms (such as father, mother, brother, water, food, deity, heaven, etc.), there are, however, notable exceptions (e.g., man); and in the case of verbs there is considerable individuality manifested in the specific meanings developed by each language from the very general one which is usually attached to a particular stem.

In the form of writing employed there is even more variation, no less than three distinct species being employed in the groups comprising the Semitic languages: (*a*) the cuneiform characters of Babylonia and Assyria, which, originating in a pictorial script, became linear or wedge-shaped (see CUNEIFORM INSCRIPTIONS); (*b*) the North Semitic alphabet, from which the various later Aramaic and North Arabic alphabets were derived; and (*c*) the South Semitic alphabet, used by Minæans, Sabæans, Himyarites, and others, from which the Ethiopic was derived. See ALPHABET; INSCRIPTIONS.

Of the various groups of the Semitic languages, the Babylono-Assyrian merits the first place by virtue of the antiquity of its literature. The excavations in Babylonia and Assyria (qq.v.) have brought to light inscriptions that apparently date back to the fifth millennium B.C., and as early as 2500 B.C. there appears to have existed quite an extensive literature, chiefly historical, legal, and religious. Later we find other branches like medicine and astronomy represented. Assyria adopted the script together with the general culture of Babylonia, and while it made few contributions to the literature outside of annals, prayers, and incantations, great care was taken by some of the kings to copy and preserve the literature produced in the south. It was also adopted by Lulubians and Gutians. The cuneiform characters in various modifications continued in use until a few decades prior to the present era. See BABYLONIA; ASSYRIA.

The Aramaic branch is distinguished by the large number of its subdivisions and dialects and by the large territory over which these subdivisions and dialects are spread at a comparatively early period. The extensive sway of Aramaic is almost coequal with the range of Semitic speech, and some of the Aramaic dialects developed sufficiently distinct traits to fall within the category of separate languages. By far the most important representative of the group is the Syriac, or the Aramaic dialect spoken in Edessa, Harran, Nisibis, and other places in Mesopotamia. The Babylonian dialect of the Aramaic was adopted by the Jews of the Exile; its form in the period 250–450 A.D. may be seen in the Babylonian Talmud. A similar dialect, though less exposed to foreign influence, was the Mandaic. The Aramaic dialect spoken in Judæa has been preserved in the Bible (portions of Ezra and Daniel) and in the earlier Targums. Another Aramaic offshoot is the Samaritan, being the dialect spoken in the district of Shechem and of importance as the tongue of the Samaritan community. The Galilean dialect, as it was spoken in the third century A.D. and later, has been preserved in many Targums and in the Palestinian Talmud. For further detail concerning these languages and their literatures, see ARAMAIC; MANDÆANS; SAMARITANS; SYRIAC.

In the Hebræo-Phœnician group the Hebrew merits the first place by virtue of the fact that the bulk of the Old Testament is written in this language. (See JEWS; BIBLE; and the articles on the separate books of the Bible.) Hebrew literature is also represented by the older division of the Talmud known as the Mishna (q.v.), containing the codification of the rabbinical laws. This section of Hebrew literature was edited about 200 A.D. A number of Midrashim are likewise written in this Neo-Hebraic speech. By this time Hebrew had long ceased to be the current speech of Jews, who in Palestine had adopted Aramaic and outside of Palestine the language of the countries in which they were settled, but Hebrew still maintained its sway as the tongue of sacred writ and as the official language of the synagogue. In view of this it continued to be cultivated not only by the learned but by the masses as well, so that from time to time Hebrew witnessed literary revivals. Such a revival took place in Spain in the eleventh and twelfth centuries, and again in Russia and eastern Europe in the nineteenth century, so that numerous works in Hebrew continue to be published up to the present time. The Hebrew of the Middle Ages and the New Hebrew are modeled entirely upon the biblical style, and, since it is artificially cultivated and nowhere used as the sole language of interchange, it can only to a limited extent be designated as one of the living Semitic languages. Hebrew being merely the Canaanitish speech adopted by the Israelites upon taking possession of Canaan, it follows that it is practically identical in its earliest form with Phœnician. The Phœnician literature is lost, and the language is known to us only from the vast number of mortuary and votive and commemorative inscriptions found in Phœnicia itself, and in even larger quantities in the colonies of the Phœnicians, notably in Cyprus, northern Africa, Sardinia, Malta, southern Spain, and southern France. These inscriptions cover the long period from about the eighth century B.C. up to the end of the second century of our era. Their interest is chiefly (1) epigraphical in enabling us to trace the development and modifications of the Phœnician script, and (2) linguistic as furnishing the means to the study of a Semitic tongue that was the first to spread outside of Semitic territory. (See PHŒNICIA.) Presenting only slight variations from the Hebrew and Phœnician is the Moabitic, represented by a single inscription of the Moabitish King Mesha. See MOABITE STONE.

Of the southern branch the chief representative is the Arabic, the Semitic language which has far exceeded all others in the wide charac-

ter of its influence. It was the rise and spread of Islam that gave to Arabic as the language of the Koran its supreme importance. Previous to that time Arabic was confined to the peninsula of Arabia; several dialects prevailed, and the one that became the classical speech was the form spoken in Mecca, the birthplace of the prophet Mohammed. Leaving Southern Arabic out of account for the present, Arabic literature previous to Mohammed was confined to poetical compositions which were preserved orally. Islam marks not only a religious innovation, but was also an intellectual movement that gave rise to written literature among the Arabs, and as the Arabs came into contact through the spread of Islam with the existing Oriental and Occidental cultures, the various branches of science, medicine, philosophy, theology, mathematics, geography, history, besides poetry, were cultivated, and an exceedingly extensive and important literature was produced in Arabic during the five centuries following the appearance of Mohammed. After that period a decline set in, though the literary activity of the Arabs never came to a standstill, and within the past 50 years, through contact with modern European culture, a new era of intellectual activity has been inaugurated among the Mohammedans in Turkey, Egypt, and India, which appears to be spreading to other centres of Islam. (See ARABIC LANGUAGE AND LITERATURE.) The culture of southern Arabia is far older than that which arose in central and northern Arabia. Possibly as early as the twelfth century B.C. a powerful kingdom existed in Yemen, and, although no literary remains have been preserved, inscriptions in large numbers have been found, revealing a distinctive variety of Semitic script as well as a distinctive species of Arabic. The relationship of the South Arabic script to the North Semitic alphabet is a problem that has not yet been cleared up. Much speaks in favor of regarding them as independent developments of the original alphabet. The South Arabic inscriptions covering a period of about 700 years (so far as they can be dated at all) are chiefly of a votive or commemorative character and throw light upon the history and religion of the old South Arabic kingdoms that at one time played no inconsiderable rôle. See ALPHABET; INSCRIPTIONS; MINÆANS; SABÆANS.

The Ethiopic literature in the proper sense, or the Geez (to use the native name), dates from the introduction of Christianity into Abyssinia. That literature is almost exclusively religious and consists mainly of homilies, religious poetry, and lives of saints, besides some chronicles. The language survives in several dialects (Tigre, Tigriña, Amharic) spoken in Abyssinia. The alphabet, derived from the South Arabian script, presents the peculiarity that the vowel sounds are indicated by modifications of the consonants which they accompany. See AMHARIC LANGUAGE; ETHIOPIA; ETHIOPIC WRITING.

Many attempts have been made, sometimes in a very superficial fashion and sometimes by the use of scientific methods, to establish a relationship between the Semitic languages and the Indo-Germanic. But all these endeavors have hitherto failed. On the other hand the Semitic languages bear so striking a resemblance in some respects to certain languages of northern Africa that the existence of some relationship between the two groups may be assumed. These languages belong to the family sometimes called Hamitic, and composed of the Egyptian, Berber, Beja (Bishari, etc.), and a number of tongues spoken in Abyssinia and the neighboring countries (Agau, Galla, Dankali, etc.). Some of the indispensable words in the Semitic vocabulary (as, e.g., water, mouth, and certain numerals) are found in Hamitic also, and these words are such as cannot well be derived from triliteral Semitic roots and are more or less independent of the ordinary grammatical rules. Important resemblances in grammar are also noted—e.g., the formation of the feminine by means of *t* prefixed or suffixed, that of the causative by means of *s*, similarity in the suffixes and prefixes of the verbal tenses, and, generally, similarity in the personal pronouns, etc. There is also much disagreement; e.g., the widest divergence is found in the mass of the vocabulary. The question is involved in great difficulties. Isolated resemblances may have been produced by the borrowing of words. But the great resemblances in grammatical formation are harder to explain as due to borrowing on the part of the Hamites, more especially as these points of agreement are also found in the language of the Berbers, who are scattered over a large territory and whose speech must have acquired its character before they came into contact with the Semites.

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SEM'ITONE (Lat. *semitonium*, half tone, from *semi-*, half + *tonus*, tone). In music, the smallest interval in the diatonic scale, as E F or B C, in which the ratio is as 15 to 16. In the pianoforte, the interval between any two notes between which no other note is interposed, as C to C♯, or B♭ to B, is a semitone.

SEMLER, zĕm'lĕr, JOHANN SALOMO (1725–91). One of the most influential German theologians of the eighteenth century. He was born at Saalfeld, where his father was archdeacon. He was educated at Halle and in 1752 was appointed professor of theology there. Semler in the early part of his career was influenced by Pietism, but later he adopted a moderate rationalism, of which he was the first systematic exponent. He was a pioneer also in biblical criticism and in the historical estimate of doctrine. His principal works are: *Apparatus ad Liberalem Veteris Testamenti Interpretationem* (1773); *De Dæmoniacis* (1760); *Umständliche Untersuchung der dämonischen Leute* (1762); *Versuch einer biblischen Dämonologie* (1776); *Commentationes Historicæ de Antiquo Christianorum Statu; Observationes Novæ quibus Historia Christianorum usque ad Constantium Magnum Illustratur* (1784). Consult his autobiography (Halle,

1781–82); Schmid, *Die Theologie Semlers* (Nördlingen, 1858); P. Gastrow, *Johann Salomo Semler in seiner Bedeutung für die Theologie mit besonderer Berücksichtigung seines Streites mit G. E. Lessing* (Giessen, 1905); H. Hoffmann, *Die Theologie Semlers* (Leipzig, 1905); F. Huber, *Johann Salomo Semler, seine Bedeutung für die Theologie* (Berlin, 1906).

SEMLIN, zĕm-lēn′ (Hung. *Zimony*). A city in Croatia-Slavonia, Hungary, situated at the junction of the Save and Danube, opposite Belgrade, Servia (Map: Austria, G 4). Noteworthy edifices are the German theatre and the ruined castle of Hunyady, the Hungarian hero, who died here in 1456. Semlin is the centre of the Turco-Austrian transit trade. Pop., 1900, 14,416; 1910, 17,103.

SEM′LIN, Charles Augustus (1836–). A Canadian political leader, born in Ontario. He went to British Columbia in 1862, settling in the Yaole-Cariboo district and engaging extensively in farming and stock raising. He was elected a Conservative member of the British Columbia Legislature in 1871, leader of the Conservative Opposition therein in 1894, and in 1898–1900 was Premier.

SEMMELWEISS, zĕm′el-vīs, Ignaz Philipp (1818–65). A Hungarian obstetrician. Born in Buda, he studied at Pest and at Vienna, in which city he became assistant in the first obstetric ward of the General Hospital. Semmelweiss noticed that the mortality from puerperal fever (q.v.) was much higher in this ward, to which came students, hastily cleansed, from the dissecting room, than in the second ward, where midwives who observed the strictest cleanliness made vaginal examinations. When finally he observed, at a post mortem of an assistant who had died from the infection of a wound received while dissecting, that the pathological appearance was the same as in the case of a woman who had succumbed to puerperal fever, he concluded that this disease was septic and infectious. By rigidly enforcing personal cleanliness among the examining students and in the ward Semmelweiss within a year reduced the mortality from 9.92 to 3.8 and within two years to 1.27. He reported his discovery in the *Zeitschrift der k. k. Gesellschaft der Aertzte in Wien* (1849) as "Höchst wichtige Erfahrungen über die Aetiologie der in Gebäranstalten epidemischen Puerperalfieber." Dr. Oliver Wendell Holmes (q.v.) in 1843 had come to the same conclusion as the Hungarian physician reached some years later independently. Like Holmes, Semmelweiss encountered great opposition, especially from Scanzoni and Siebold (qq.v.), although the Viennese school of obstetricians stood by him. He left Vienna and went to Pest, where in 1854 he became professor of obstetrics at the university. But the controversy eventually affected his mind, and he died insane. In 1906 a monument in his memory was erected in Pest. Semmelweiss' best-known work is *Die Aetiologie, der Begriff, und die Prophylaxis der Kindbettfiebers* (1861). His *Gesammelte Werke*, including letters written in defense of his theory, were published by Györoy at Jena in 1895.

SEMMERING, zĕm′ĕr-ing. A pass 3300 feet above the sea in the Semmering Alps, Austria, between Gloggnitz in Lower Austria (47 miles by rail southwest of Vienna) and Mürzzuschlag in Styria, a distance by rail of 33 miles. It was opened by a bridle path in the thirteenth century. The beauty of the scenery and the desirableness of the climate make this one of the most frequented of the health resorts in the Austrian Alps. The railway, the first of the great continental mountain railways and still considered a remarkable engineering feat, completed in 1854, passes 282 feet below the summit through a tunnel 1 mile long. It has 15 tunnels and 16 viaducts.

SEMMES, sĕmz, Raphael (1809–77). An American naval officer, born in Charles Co., Md. In 1832 he entered the United States naval service as a midshipman. He studied law and was admitted to the bar in 1834, but remained in the navy. During the Mexican War he was the flag lieutenant under Commodore Connor of the Gulf squadron and commanded a shore battery at Vera Cruz. After the war he was made inspector of lighthouses, became commander in 1855, and in 1858 was secretary of the Lighthouse Board. He resigned from the navy on Feb. 15, 1861, and soon afterward was commissioned by President Davis of the Confederate States to secure skilled mechanics and military supplies in the North. On April 18, 1861, he was commissioned commander in the Confederate navy and soon went to New Orleans to fit out the *Sumter*, which escaped from the port and captured 17 prizes before she was blockaded in Tangier by two American ships in January, 1862. Semmes then sold the *Sumter* and in August, 1862, at the Azores, took command of the *Alabama*, which became the most noted of the Confederate commerce destroyers. (See Alabama Claims.) On June 19, 1864, the *Alabama* engaged the United States ship *Kearsarge* off the coast of Cherbourg, France, and was sunk. Captain Semmes was picked up by the English yacht *Deerhound*, was taken to England, and soon afterward returned to the Confederate States. He was appointed rear admiral and was placed in charge of the James River squadron. When Richmond was evacuated the ships were blown up and Admiral Semmes was commissioned brigadier general and put in charge of the defenses of Danville, Va. Upon General Lee's surrender he joined Gen. Joseph E. Johnston, with whom he surrendered. For a while he was professor in the Louisiana Military Institute. While practicing law at Mobile, Semmes was arrested, Dec. 15, 1865, by order of Secretary Welles, on charges of treason, but was released by the third amnesty proclamation of President Johnson. He published: *Service Afloat and Ashore during the Mexican War* (1851); *Campaigns of General Scott in the Valley of Mexico* (1852); *Cruise of the Alabama and Sumter* (1864); *Memoirs of Service Afloat during the War between the States* (1869). Consult Colyer Meriwether, *Raphael Semmes*, in "American Crisis Biographies" (Philadelphia, 1913).

SEM′NOPITH′ECI′NÆ. See Guereza; King Monkey; Proboscis Monkey.

SEMOLINA, sĕm′ō-lē′nȧ (It. *semolino*, grits, soup paste, small seed, dim. of *semola*, bran, from Lat. *simila*, fine wheat flour), Semola, or Semoule. A coarse granular product made from wheat after the bran has been removed. The name is also applied to a by-product in wheat-flour making, especially from hard wheats, being the particles retained in the bolting machine and used for thickening soups, for puddings, etc. It is widely used in the manufacture of macaroni, etc., and is a favorite food in Italy and France. Its average percentage composition is: water, 13.1; protein, 9.4; fat, 0.9; nitrogen-free extract

(chiefly starch), 76.2; ash, 0.4. Cereal breakfast foods are common in the United States which are essentially semolinas, sterilized and marketed in tight packages and sometimes parched as a part of the manufacturing process. See "Manufacture of Semolina and Macaroni," *United States Department of Agriculture, Bureau of Plant Industry, Bulletin 20* (Washington, 1902).

SE'MON, Sir Felix (1849–). A British laryngologist. He was born in Danzig, West Prussia, and received his medical education at Berlin, Heidelberg, Vienna, Paris, and London (St. Thomas's), graduating in 1873. During the Franco-Prussian War of 1870–71 he saw active service. In 1874 he settled in London, where he became connected with St. Thomas's Hospital from 1882 to 1897, holding the post of physician for diseases of the throat. He was president of the Laryngological Society and was appointed physician extraordinary to King Edward VII in 1901. In 1897 he was knighted. Sir Felix made important observations which demonstrated that cretinism, myxoedema, and cachexia after extirpation of the thyroid constitute but one condition. He published many essays, especially on laryngology, is the author of *Forschungen und Erfahrungen, 1880–1910* (1911), and translated into German Sir Morell Mackenzie's *Diseases of the Throat and Nose.* He also edited *Die Frage des Ueberganges gutartiger Kehlkopfgeschwülste in bösartige* (1889).

SEMONIDES OF AMORGOS. See Simonides of Amorgos.

SEMPACH, zĕm'päĸ. A small town of Switzerland, situated on the east shore of the Lake of Sempach, northwest of Lucerne. At Sempach took place the second great conflict (July 9, 1386) between the confederated Swiss cantons and the house of Hapsburg. The renewal of the strife was due chiefly to the encroachments of the Swiss upon Hapsburg territory. The Hapsburg army, led by Duke Leopold in person, consisted of 4000 horse and 1400 foot, while the Swiss are said to have numbered only 1300 men. The latter won a complete victory, as is claimed, through the heroic self-sacrifice of Arnold von Winkelried (q.v.). Duke Leopold and 1400 nobles are said to have been slain. A chapel and a monument mark the battlefield. Consult Theodor von Liebenau, *Die Schlacht bei Sempach* (Lucerne, 1886).

SEMPER, zĕm'pĕr, Gottfried (1803–79). A German architect, born at Hamburg, Nov. 29, 1803. After studying law at Göttingen, he took up architecture, principally under Gau at Paris. His travels in Italy, Sicily, and Greece led to his writings on the practice of polychromy by the Greeks. In 1834 he was appointed professor of architecture in the Academy of Dresden. There he built the Royal Theatre, the new Synagogue, and had just begun the New Museum, when his participation in the revolution of 1849 compelled him to leave the city. In 1851 he went to London, where his advice was of great weight in industrial art instruction and in the organization of South Kensington Museum. In 1855 he accepted a call to the professorship of architecture in the newly organized Polytechnicum at Zurich, for which he designed the building, which is one of his masterpieces. While at Zurich he also designed the railroad station, the Kurhaus at Baden, and the town hall at Winterthur. The theatre at Dresden, which had in the meanwhile been burned, was rebuilt after his plans in 1871–78 with increased splendor, under supervision of his son Manfred. In 1871 he was called to take part in the architectural reconstruction of Vienna, the Imperial Palace, the new theatre, and the two museums being allotted him. He died at Rome, May 15, 1879.

Semper was thoroughly versed in the forms of the Italian Renaissance and understood how to adapt them to present-day needs. His buildings are harmonious in design, careful and excellent in detail. He was also a distinguished writer upon architectural subjects. Among his chief works are: *Ueber Polychromie und ihren Ursprung* (Brunswick, 1851); *Wissenschaft, Industrie und Kunst* (ib., 1852); and his masterpiece, *Der Stil in den technischen und tektonischen Künsten* (Stuttgart, 1878). His plans and sketches were published after his death (Leipzig, 1881). Consult Constantin Lipsius, *Gottfried Semper in seiner Bedeutung als Architekt* (Berlin, 1880), and Hans Semper, *Gottfried Semper: ein Bild seines Lebens und Wirkens* (Dresden, 1880).

SEMPER, Karl (1832–93). A German zoölogist, born at Altona. He studied at Würzburg, and in 1858 he went to the Philippines, where he traveled until 1864. Returning to Germany, he became lecturer at the University of Würzburg, where, in 1872, he was appointed professor of zoölogy and director of the zoölogical museum and laboratory. In 1877 he gave a course of lectures at Boston which were afterward published under the title *Animal Life as Affected by the Natural Conditions of Existence.* Semper's chief works, besides the *Animal Life,* are: *Die Philippinen und ihre Bewohner* (1869); *Die Palauinseln* (1873); *Reisen im Archipel der Philippinen* (1867–72); *Die Verwandschaftsbeziehungen der gegliederten Thiere* (1875); *Die natürlichen Existenzbedingungen der Tiere* (1880). Semper was also the founder (1871) of the zoölogical periodical *Arbeiten aus dem zoologisch-zootomischen Institut in Würzburg,* in which journal most of his essays appeared.

SEM'PILL, Robert (c.1530–95). A Scottish ballad writer, who wrote many broadsides in support of the Reformation in Scotland. For them consult *The Sempill Ballates* (ed. by Stevenson, Edinburgh, 1872) and *Satirical Poems of the Time of the Reformation* (ed. by Cranstoun for the Scottish Text Society, 2 vols., ib., 1889–93).

SEMPLE, Ellen Churchill (1863–). An American anthropogeographer, born at Louisville, Ky. She graduated from Vassar College in 1882 and studied at the University of Leipzig in 1891–92 and 1895. Miss Semple was one of the first Americans to make a special study of the influence of geographic conditions upon the development of society. After 1897 she contributed a number of articles to the *Bulletin of the American Geographical Society,* the *Journal of Geography* (New York), and the *Geographical Journal* (London). She published *American History and its Geographic Conditions* (1903) and *The Influence of Geographic Environment* (1911).

SEN, sān, Keshub Chunder, kĕ-shūb' chŭn'-dĕr (*Keśavachandra Sena*) (1838–84). A Hindu religious reformer, born in Bengal. He received a mixed native and English education. He came into prominence in connection with the Theistic church of India or the Brahmo-Somaj (q.v.), which he joined in 1857. In 1865 a division resulted, and the majority became known as the

"progressive Somaj" with Sen as the acknowledged leader. In 1870 he visited England, where he was cordially received. When, in 1878, however, Sen, who had been one of the prime movers in the passage of the law against child marriage, permitted his daughter of 13 to wed the Maharajah of Cutch Behar, he was deposed by some of his congregation and thenceforth his personal prestige declined. In 1881 he celebrated what he called the birth of the New Dispensation, promulgating the teachings which he had imbibed from Ramakrishna (q.v.). His lectures delivered in England were published in Calcutta (1881), while those delivered in India were issued at London (2 vols., 1901). He was the author of *Yoga, Objective and Subjective* (1884). Consult Slater, *Keshab Chandra Sen and the Brāhma Samāj* (Madras, 1884), and Mozoomdar, *Life and Teachings of Keshub Chunder Sen* (Calcutta, 1888).

SENANCOUR, se-nän'kōōr', Etienne Pivert de (1770–1846). A French philosopher and littérateur, remembered almost solely as the author of *Obermann*. He was born in Paris of a noble family ruined by the Revolution. He was sickly from childhood. Though destined for the Church, he escaped from the Seminary of Saint-Sulpice to Switzerland, with his mother's help, and married there. He returned to Paris after his wife's death, about 1800, and remained there in poverty, relieved at the last by a modest pension, till his death at Saint-Cloud. His more noteworthy works, besides *Obermann* (1804), are *Rêveries sur la nature primitive de l'homme* (1799), *De l'amour selon les lois primordiales* (1805), *Observations sur le génie du christianisme* (1816), and a feeble romance, *Isabelle* (1833). *Obermann* alone "has qualities which make it permanently valuable to kindred minds." (Matthew Arnold.) In form a novel, it is in fact a series of melancholy reflections on nature and society. Senancour found self-forgetfulness only in nature, his descriptions of which are often beautiful. *Obermann* is translated with a biographical and critical introduction by A. E. Waite (New York, 1903). Consult J. Merlant, *Senancour: poëte, penseur religieux, et publiciste* (Paris, 1907), and G. Michaut, *Senancour: ses amis et ses ennemis* (ib., 1909).

SENART, se-när', Emile Charles Marie (1847–). A French Orientalist, born at Rheims. From 1864 to 1868 he studied Sanskrit in Munich and in Göttingen under Benfey. Except for a short period of political activity he devoted himself entirely to the languages and literature of India. He was elected to the Institute of France in 1882. His most famous work, *Essai sur la légende du Bouddha* (1875; 2d ed., 1882), advanced the theory that the tradition in regard to Buddha represents an old sun myth. Senart's other works include: *Kaccāyana et la littérature grammaticale du Pâli* (1871); *Les inscriptions de Piyadasi* (2 vols., 1881–86); *Les castes dans l'Inde* (1896); an edition of the *Mahāvastu* (3 vols., 1892–97); *Les origines bouddhiques* (1907).

SENATE. The name commonly applied to the upper chamber of a legislative body. At Rome the Senate was the counsel of elders (cf. Lat. *senex*, old man); the members were called *senatores* or *patres*. Strictly the latter term was confined at first to the original patrician (q.v.) members of the body; the new members, added, according to one tradition, by Brutus after the expulsion of the Tarquins, were called *patres conscripti*, conscript fathers (q.v.). Later the terms *patres* and *senatores* were used interchangeably of all members. According to Livy (i, 8) the Senate consisted at first of 100 members, all chosen by Romulus; later, before 509 B.C., the number was increased to 300. From 81 B.C. it was 600, till Julius Cæsar in his dictatorship raised it to 900. Augustus and later emperors kept the total at about 600. At first the senators were chosen by the king, then by the consuls, and then, perhaps from 339 B.C. onward, by the censors. In 216 and 81 B.C. the dictators, M. Fabius Buteo and Lucius Cornelius Sulla, chose senators; this precedent was followed by Julius Cæsar. Augustus and later emperors also chose senators in virtue of their occupancy of the office of censor (q.v.). Plebeians were not eligible, apparently, till after 400 B.C.; later, senators were chosen from those who had been quæstor, curule ædile, prætor, or consul. (For expulsion from the Senate, see Censor.) The Senate was at first only an advisory body, with the right to give counsel, on request, to the king or, later, to the republican magistrates. Under the Republic, since the magistrates held office for only a year, whereas the senators held office virtually for life, the power of the Senate tended to increase. As the Roman domain grew and the administration of the Roman government became more and more complex, the power of the Senate further increased, till it became the governing body of the state, particularly in foreign relations. At first the *plebiscita* passed in the *comitia tributa* (see Comitia, 3) were binding only if approved by the Senate; later, the Senate was compelled by law to give its *auctoritas* to such measures in advance of passage. It was the breakdown of senatorial power that hastened the era of personal rule represented by Marius and Sulla, Cæsar, Pompey the Great, and, finally, Augustus and his successors. See Rome, *History*, passim. Consult: P. Willems, *Le sénat de la république romaine* (2d ed., Louvain, 1883); Theodor Mommsen, *Römisches Staatsrecht*, vol. iii (3d ed., Leipzig, 1887); "Senatus," in William Smith, *A Dictionary of Greek and Roman Antiquities*, vol. ii (3d ed., London, 1891); A. H. J. Greenidge, *Roman Public Life* (ib., 1901); G. W. Botsford, *The Roman Assemblies* (New York, 1909); F. F. Abbott, *A History and Description of Roman Political Institutions* (3d ed., Boston, 1911). For the Senate in ancient Athens, see Boule; for that in Sparta, see Gerousia. See government sections under United States; France; Italy; Spain. See also Congress; Committee.

SENATOR, zâ-nä'tôr, Hermann (1834–1911). A German physician, born in Gnesen and educated at Berlin (M.D., 1857), where he became professor of clinical medicine and principal physician of the Augusta Hospital in 1875 and six years afterward directing physician in the Charité Hospital. He made important investigations in diabetes and albuminuria and wrote, among other works: *Untersuchungen über den fieberhaften Prozess und seine Behandlung* (1873); *Die Krankheiten des Bewegungsapparats und Diabetes mellitus und insipidus* (1879); *Die Albuminurie im gesunden und kranken Zustande* (1881; Eng. trans. by T. P. Smits, *Albuminuria in Health and Disease*, 1884); *Die Albuminurie in physiologischer und klinischer Beziehung und ihre Behandlung* (1890); *Die Erkrankungen der Nieren* (1895; Eng. trans.

by J. B. Herrick, *Diseases of the Kidneys and of the Spleen*, 1905); *Krankheiten und Ehe* (1904, with S. Kaminer; Eng. trans. by J. Dalberg, *Marriage and Disease*, 1907).

SEN'ATO'RIAL COURTESY. The term applied to a custom in the United States Senate by which the procedure of that body is based chiefly on the honor of Senators rather than upon strict rules such as exist in the House of Representatives. Thus, it is a part of senatorial courtesy that a member shall not be interrupted in the course of a speech on the ground that his time has expired, but may speak without limit. It is a part of the same custom that personal requests of Senators, as for the immediate consideration of a favorite measure, shall be granted. It has also come to be a part of senatorial courtesy that the Senate will refuse to confirm the nomination of an appointment to office in a State whose Senators object to the person nominated. The result of this unwritten rule often makes it necessary for the President to consult beforehand with the Senators from a State in which he is called upon to make an appointment.

SENCI, sān'sē. A warlike tribe of Panoan stock (q.v.), occupying the hill country east of the Ucayali River, about Sarayacu, northeastern Peru. They are described as among the greatest warriors of the Ucayali region and bold and generous in disposition. Their weapons are the bow, lance, club, and kowas, a sort of combined club and stabbing instrument. They are agricultural and very industrious.

SENDAI, sĕn'dī'. The capital of the Prefecture of Miyagi, Japan, situated near the eastern coast of Hondo, 217 miles by rail north of Tokyo (Map: Japan, G 4). It is noted as the former seat of the daimyo, Date Masamune (1567–1636), who sent an embassy to the Pope and the King of Spain in 1614. His castle, somewhat damaged during the revolution of 1868, is now used by the garrison. The principal products are ornamental articles of fossil wood, found in the vicinity, and cloth. Sendai is the seat of North Japan College. Pop., 1898, 83,325; 1908, 97,944.

SEN'ECA. One of the leading tribes of the Iroquois (q.v.) Confederacy. The popular name is foreign to the tribe and of uncertain origin. They call themselves Tshoti-nondawaga, abbreviated Nondowaga (people of the hill), and were formerly known to the French as Tsonnonthouan. In the Iroquois councils they were officially designated as the doorkeepers, in allusion to their guarding the western door or frontier of the confederacy. The Seneca were the ruling spirits of the Iroquois league in the West, as the Mohawk were in the East, and the wars waged with the Huron, Neutral Nation, Erie, and Illinois, as well as with the southern tribes, were carried on chiefly by them. When first known they occupied that part of western New York between Seneca Lake and the Genesee River, having their council fire at Nundawao, near the present Naples. After the destruction of the Erie and Neutral Nation about 1650–60, the remnants of these tribes were chiefly incorporated with the Seneca, who soon spread over the conquered territory westward to Lake Erie and southward along the Allegheny. By these accessions they became the largest and most important tribe of the confederacy. They sided with the English in the Revolution, for which their villages and fields were wasted by Sullivan in 1779, but did not abandon their country, and are still residing mainly within their original territory in New York State. See IROQUOIS.

SENECA, ANNÆUS. A Roman rhetorician, born at Corduba (Cordova) in Spain, probably not later than 54 B.C. He seems to have been in Rome during the early period of the power of Augustus. He was rich, belonged to the equestrian order, and enjoyed the friendship of many distinguished Romans. The time of his death is uncertain, but he lived perhaps until 39 A.D. His extant works are *Controversiarum Libri X*, a collection of imaginary law cases for practice in discussion, and *Suasoriarum Liber*, a collection of "themes"; neither of these works, however, is complete. The best editions are those of Kiessling (Leipzig, 1872) and Müller (Prague, 1887). Consult W. S. Teuffel, *Geschichte der römischen Literatur*, vol. ii (6th ed., Leipzig, 1910), and Martin Schanz, *Geschichte der römischen Litteratur*, vol. ii, part ii (3d ed., Munich, 1913).

SENECA, LUCIUS ANNÆUS (c.4 B.C.–65 A.D.). A Roman Stoic philosopher, the son of Annæus Seneca (q.v.), born at Corduba about 4 B.C. In philosophy his first teacher was the Pythagorean Sotion, whom he afterward left to follow Attalus the Stoic. He traveled in Greece and Egypt and pleaded in courts of law, but notwithstanding his forensic triumphs he left the bar from fear of Caligula's jealousy. He filled the office of quæstor and had already risen high in the favor of the Emperor Claudius when he was accused of an intrigue with Julia, the daughter of Germanicus and wife of Vinicius. He was exiled to Corsica for eight years, deriving from philosophy what consolation he could. When Claudius married Agrippina (q.v.), Seneca was recalled by her influence, raised to the prætorship, and appointed instructor of her son Nero (q.v.). On the death of his governor and military tutor, Burrus, Nero gave way to his depraved passions with a force which Seneca could not control. All his influence over his pupil was lost, but he profited by his extravagant bounty to such a degree that his accumulated wealth amounted to 300,000 sestertia, or about $12,000,000 of our money. Seneca, to avert dangerous consequences, offered to refund to the Emperor his gifts and begged leave to retire on a small allowance. This Nero declined, and Seneca under pretense of illness shut himself up and refused to appear in public. Nero then attempted to have him poisoned, but failed. A short time afterward Antonius Natalis, when on his trial for participation in the conspiracy of Piso (q.v.), implicated Seneca as one of the conspirators. He was sentenced to put himself to death. His wife, Paulina, declared her resolution to die with him and in spite of his remonstrances accompanied him into the bath in which according to his own choice he was to be bled to death. The Emperor, however, would not allow Paulina to die, but removed her from her husband, who gradually expired.

Seneca's extant writings are mainly on moral subjects and consist of epistles, and treatises on Anger, Consolation, Providence, Tranquillity of Mind, Philosophical Constancy, Clemency, The Shortness of Life, A Happy Life, Philosophical Retirement, and Benefits. He wrote also seven books entitled *Quæstiones Naturales*. Ten tragedies, ascribed to him by Quintilian and generally included in editions of his works, have also come down to us. They were not intended, and are certainly not adapted, for the stage. They are

overcharged with declamation and wanting in dramatic life. They are of importance in dramatic history on account of the great influence they exerted on Renaissance and French classical drama as well as on English drama. Of his genuine prose writings modern opinion takes a divided view—some critics praising his practical sagacity, others finding him wanting in speculative reach. The *Apocolocyntosis Divi Claudi* is a most amusing satire on the deceased Emperor Claudius; the word *apocolocyntosis* (pumpkinification) is coined humorously for *apotheosis* (deification). It is published in Bücheler's *Petronius* (5th ed., Berlin, 1912) and edited by A. P. Ball (New York, 1903). The larger works are edited by Haase (Leipzig, 1893–95) and by Hosius (ib., 1899 et seq.); the tragedies were edited also by Fr. Leo (Berlin, 1878–79), the epistles by O. Henze (Leipzig, 1898), the *Quæstiones Naturales* by A. Gercke (ib., 1907). The tragedies were edited by Holtze in the Tauchnitz series (ib., 1872); there are separate English editions of the *Medea* by Kingery (Crawfordsville, 1896), and of the *Medea, Troades,* and *Hercules Furens* together by Kingery (New York, 1908). Recent translations of Seneca's tragedies are those by E. I. Harris (Oxford, 1904) and F. J. Miller (Chicago, 1907). Consult: G. A. Simcox, *A History of Latin Literature,* vol. ii (New York, 1883); J. W. Cunliffe, *The Influence of Seneca on Elizabethan Tragedy* (London, 1897; reprinted, New York, 1907); H. E. Butler, *Post-Augustan Poetry* (Oxford, 1909); the admirable "Introduction" to W. C. Summers, *Select Letters of Seneca* (London, 1910); W. S. Teuffel, *Geschichte der römischen Literatur,* vol. ii (6th ed., Leipzig, 1910); E. M. Spearing, *The Elizabethan Translations of Seneca's Tragedies* (Cambridge, 1912); J. W. Cunliffe, *Early English Tragedies* (Oxford, 1912); Martin Schanz, *Geschichte der römischen Litteratur,* vol. ii, part ii (3d ed., Munich, 1913); M. S. Dimsdale, *A History of Latin Literature* (New York, 1915); J. D. Duff, *Senecæ Dialogorum Libri X, XI, XII* (Cambridge, 1915).

SENECA FALLS. A village in Seneca Co., N. Y., 41 miles by rail west of Syracuse, on the Seneca River and Barge Canal, and on the New York Central and the Lehigh Valley railroads (Map: New York, D 5). It has the Mynderese Academy, a public library, a hospital, and the Johnson Home for Indigent Females. Cayuga Lake Park, 2 miles distant, is a summer resort of prominence. Seneca Falls manufactures pumps, hydraulic and foot power machinery, gas engines, foundry products, lathes, rugs, boxes, rulers and advertising novelties. Seneca Falls was settled in 1791 and was incorporated in 1831. Pop., 1900, 6519; 1910, 6588; 1915 (State census), 7018.

SENECA GRASS. See Holy Grass.

SENECA LAKE. The largest and deepest of the group of elongated lakes in west-central New York (Map: New York, D 5). It is 37 miles long and from 1 to 4 miles wide, and its greatest depth is about 630 feet. Its shores are bold, and the surrounding country is picturesque. It receives the waters of Keuka Lake and discharges into Lake Ontario through the Seneca and Oswego rivers. It is navigated by steamers and connected by canals with the Erie Canal and Chemung River.

SENECA SNAKEROOT. See Polygala; Senega.

SENECIO, sẽ-nē′shĭ-ō. A genus of plants of the family Compositæ. The species, of which fully 1000 have been described, are mostly herbs individually restricted in range, but generically of almost world-wide distribution, and especially abundant in temperate climates. Groundsel and ragwort are common names often applied to many species. Some species are used for fuel; others were formerly reputed useful for wounds; several species, especially *Senecio cineraria* (dusty miller), *Senecio mikanioides* (Cape ivy), and *Senecio argenteus* (silvery senecio), are widely popular ornamental plants.

SENEFELDER, zā′ne-fĕl′dĕr, Aloys (1771–1834). The inventor of lithography. He was born at Prague, Bohemia, but was early taken to Munich, where he became an actor. He then turned his attention to the printing of music, and invented the process of printing from stone known as lithography (q.v.). After unsuccessful attempts to found establishments in Munich, Offenbach, and Vienna, he returned in 1806 to Munich and accepted the position of inspector of maps at the royal printing office, continuing his private establishment as well. In 1826 he invented the process of lithographing in colors and in 1833 perfected it so that he could print the colors on linen, thus imitating oil painting. In 1877 a monument was erected to his memory in Munich. He wrote a *Lehrbuch der Lithographie* (1818), which was translated into French (1819), and *Behandlung des Ueberdrucks auf der kleinen lithographischen Handpresse* (1824). Consult his *Invention of Lithography* (Eng. trans. by J. W. Muller, New York, 1911); also G. K. Nagler, *Aloys Senefelder und Simon Schmidt als Rivalen* (Munich, 1862); Ernst Pfeilschmidt, *Aloys Senefelder* (Dresden, 1877).

SENEFFE, sẽ-nĕf′. A small village in the Province of Hainault, Belgium, 22 miles southwest of Brussels (Map: Belgium, C 4). The district has extensive manufactures of pottery and glass. Near by is the battlefield on which William of Orange, at the head of the force of the coalition against France, was defeated, after a bloody contest, by Condé, Aug. 11, 1674.

SEN′EGA, or Seneca Snakeroot. The dried root of *Polygala senega.* It is employed in medicine as an expectorant and diuretic and is valuable in chronic bronchitis, asthma, and certain types of pneumonia. Its properties are due to senegin, a glucoside which is identical with saponin and closely related to digitonin. Its pharmaceutical preparations are a fluid extract, a sirup, and a compound sirup.

SENEGAL, sĕn′ẽ-gąl′ (Fr. *Sénégal*). A river of the French Colony of Senegal, on the southwest border of the Sahara (Map: Africa, C 3). Its principal head stream, the Bafing or Black River, rises in the mountains of Futa Jallon, the water divide which separates the Senegal from the Niger, and flows north till it is joined by the Bakhoi or White River at Bafulabe. The combined stream then flows generally northwestward and empties into the Atlantic Ocean, at Saint-Louis, 110 miles north of Cape Verde. It is the first perennial stream for a distance of 1300 miles south of Morocco and marks the northern limit of the migration of the doldrum belt with its copious rain. Its length is about 1000 miles. The upper course forms during the wet season a series of rapids, but in the dry season the stream becomes a series of reservoirs. Below the confluence of the head streams the river descends from the plateau in the Falls

of Guine and Felu, each about 50 feet high. In its lower course it flows through a narrow but low and level and very fertile alluvial plain, in which it frequently divides to form large elongated islands which are flooded during high water. The river empties, through a large delta, into a long, narrow coast lagoon cut off from the sea by a bar of sand. Through the latter there is a shifting opening which is very difficult and dangerous to enter. The Senegal is navigable to the Felu Falls, and there is a regular service in the rainy season to Kays (460 miles), whence a railroad has been built to Bafulabe and is being extended to Bammaku on the Niger. The Faleme, the principal tributary, is also wide and deep and navigable over 100 miles. Consult bibliography under SENEGAL (colony).

SENEGAL. A French colony in west Africa, extending along the coast from Cape Blanco to the northern boundary of Portuguese Guinea, excluding the British Colony of Gambia (Map: Africa, C 3). In 1902 the part east of Kays, comprising the protected states along the upper Senegal and the middle Niger, was detached from Senegal and was constituted a separate division of French West Africa under the name of the Senegambia and Niger Territory. In 1904 this territory was dissolved, one part of it, the Senegal Protectorate, having been restored to that colony, but with a separate budget, and the rest of it formed into the Colony of Upper Senegal-Niger (area, 302,200 square miles), with its capital at Bamako on the Niger. This article treats only of the Colony of Senegal, the area of which is 74,000 square miles.

The coast district is mostly flat and sandy and most fertile in the valley of the Senegal. The northern part belongs to the region of the Sahara, while the portion south of the Senegal is densely wooded and better watered. In the interior elevations of nearly 2000 feet are met with. The western part is drained by the Senegal, whose main head stream is the Bafing and which receives the Faleme from the south and the Kulu from the north. The Faleme is navigable. The portion south of Gambia is watered by the Salum and the Casamance.

The climate of Senegal is on the whole unhealthful. The year is divided into two seasons, a short rainy and a long dry season. The rainy season begins at the end of May and lasts three or four months at the mouth of the Casamance, and in the middle of July for barely a month at Saint-Louis. During the dry season the temperature at Saint-Louis occasionally falls as low as 46° F., but during April and May the northeastern wind from the Sahara not infrequently raises it over 110° F. in the shade. Yellow fever often comes with the rainy season. The flora of the northern part is on the whole scanty, but abounds in gummiferous acacia. In the valley of the Senegal the vegetation is luxuriant and the region south of the river is rich in palms.

Agriculture shows in recent years a notable development, insuring Senegal a place among the successful colonies of the world. The leading crops include millet, corn, manioc, and peanuts. Of these, the peanut is by far the most important commercially, constituting the principal export. The product is used chiefly for its extractive oil, the residue being employed in Europe as fodder for cattle. Small quantities of gum, rubber, wax, and palm kernels are produced. Grazing is of some importance, especially among the Peulh, Toucouleur, and Serer. The natives produce, with more or less skill, some textiles and metal ware.

Imports and exports of merchandise were valued at 67,860,000 and 56,020,000 francs respectively in 1912. The larger imports in 1912 were cotton tissues, coal, rice, cola nuts, sugar, wine, edible oils, tobacco, and flour. Exports in 1912: peanuts, 41,163,000 francs; gums, 2,315,000; rubber, 1,077,000; palm kernels, 706,000; horned cattle, 263,500. Of the total trade, 54.64 per cent was with France.

The principal waterway, the Senegal, is navigable from mid-July to early October as far as Kayes (in Upper Senegal and Niger). A railway, completed in 1885, connects Dakar, capital of French West Africa, with Saint-Louis, capital of Senegal, by way of Rufisque, Thiès, and Louga, the total length being 264 kilometers (170 miles). At Thiès, which is 91 kilometers (57 miles) from Dakar, a line starts for Kayes; in 1914 construction had been completed as far as Koulougadougou, 348 kilometers (216 miles).

The budget for 1915 was 6,031,000 francs; the local budget, 2,070,000 francs. Senegal is administered by a lieutenant governor, resident at Saint-Louis, representing the Governor-General of French West Africa; he is assisted by a general council. Four communes (Dakar, Saint-Louis, Rufisque, and Gorée) are organized like French communes and elect a deputy to the French Chamber. Certain territory, as a strip of land 1 kilometer wide on each side of the railway from Dakar to Saint-Louis, is under direct administration. The remaining portions of the country are called protected territories, in the administration of which the natives have a voice.

The official *Annuaire* for 1914 states the population at 1,247,979, consisting of 4229 French, 646 foreigners, 1,239,503 natives (French subjects), and 3601 natives (not French subjects). The natives (French subjects) included 888,467 Mohammedans, 346,336 fetishists, and 4500 Roman Catholics. The principal races are the Wolof (about 466,000), Serer (183,000), Peulh (168,000), Toucouleur (139,000), Diola (97,000), Mandingo (73,000), Bambara (34,000), and Fulah (32,000). The Wolof inhabit the coast region; they are very black and of excellent physique and peaceful disposition; they are Mohammedan, and their language is the lingua franca of Senegal. The Serer also dwell in the west (in Baol, Sine, Saloum, and in part of the circle of Thiès); strongly attached to their own customs, they remain fetishists and are little influenced by contact with Europeans; they are remarkable for industry and foresight. The Peulh, mostly nomad graziers, are found throughout Senegal; their clear skin and fine features suggest a Semitic origin, but their language is akin to the languages of the Wolof and Serer. The Peulh for the most part are recent converts to Islam; some of them retain the ancient fetishism. The Toucouleur are a warlike but intelligent race, dwelling chiefly in the north, in the Fouta region; they are Mohammedan and speak the same language as the Peulh. The principal towns, with population, are: Dakar, 25,630 (of whom 2397 French); Saint-Louis, 22,276 (896); Rufisque, 12,490 (311); Tivavouane, 3443 (96); Thiès, 2397 (129); Louga, 1806 (84); Gorée, 1140 (45).

The Senegal was discovered by navigators from Dieppe in the fourteenth century. In 1582 a French company established a factory at the

mouth of the Senegal, which became the town of Saint-Louis in 1626. The Dutch settlements along the coasts were acquired by the French through the Treaty of Nimeguen in 1678. In 1758 the French possessions of Senegal were taken by the British and restored in 1783, but seized again in 1800 and 1809 and finally restored to the French in 1817. The Moorish tribes of the north, who showed the greatest resistance to the French rule, were pacified by General Faidherbe in 1860. He also did much to explore and open up the country.

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SENEGAL GUM. See GUMS.

SEN'EGAM'BIA. A region in west Africa. See SENEGAL.

SENEGA ROOT. See POLYGALA; SENEGA.

SENEN DE CONTRERAS, JUAN. See CONTRERAS, JUAN SENEN DE.

SENES'CENCE (from Lat. *senescere*, to grow old, from *senere*, to be old, from *senex*, old). The state of transition to old age. Old age, rapid decay, and a sudden collapse with death occur in many insects immediately after egg laying. On the other hand lobsters and crabs, oysters, and other mollusks lay eggs year after year for some 20 years. Certain animals keep growing for a century. (See LONGEVITY.) We see in domestic animals that as old age creeps on they become affected like man. They lose their acuteness of hearing, become stiff in their limbs, and enter into a senile state. See SENILITY.

In many forms of animal life senile characteristics become inherited in middle life. Hyatt has shown that in ammonites and other mollusks the species and type may arise as larval or immature forms, become mature, more or less specialized and ornamented, and then die out in a series of senile forms which recall those of the childhood of the type. See GROWTH.

Consult: Hyatt, "Genesis of the Arietidæ," in *Smithsonian Institution, Contributions to Knowledge* (Washington, 1889); Minot, "Senescence and Rejuvenescence," in *Journal of Physiology*, vol. xii (London, 1891); "Phylogeny of an Acquired Characteristic," in *Proceedings of the American Philosophical Society* (Philadelphia, 1894); C. S. Minot, *Modern Problems of Biology* (ib., 1913).

SENESCHAL, sĕn'*e*-shal (Fr. *sénéchal*, from ML. *senescalcus, siniscalcus*, from Goth. *sineigs*, old; connected with Lat. *senex*, Gk. *ἕνος, henos*, old + *skalks*, servant). Originally probably an attendant of the servile class who had the superintendence of the household of the Frankish kings. In the course of time, however, the seneschalship rose to be a position of dignity, held no longer by persons of servile race, but by military commanders, who were also invested with judicial authority. The dignity of Grand Seneschal of France was the hereditary right of the counts of Anjou. This office gave the right to command the armies in the absence of the King, control over the affairs of the King's household, and the exercise of supreme judicial authority. Philip Augustus, however, in 1191 suspended the judicial functions. The lieutenants of the chief feudatories of France often took the title of seneschal, and, as in the course of time the great fiefs were absorbed by the crown, they were as a rule divided for judicial purposes into districts under the authority of royal officers, who retained the old name, while the districts were known as sénéchaussées. A similar office in England and Scotland was designated *steward*, but is rendered into Latin as *senescalcus*. Consult Achille Luchaire, *Manuel des institutions françaises* (Paris, 1892).

SENEUIL, JEAN GUSTAVE COURCELLE-. See COURCELLE-SENEUIL, J. G.

SENEY, sē'nĭ, GEORGE INGRAHAM (1826–93). An American philanthropist, born at Astoria, N. Y. He attended Wesleyan University in 1845 and graduated from the University of the City of New York in 1847. From 1877 to 1884 he was president of the Metropolitan Bank of New York. He gave $410,000 for the endowment of the Methodist Hospital in Brooklyn; added largely to the endowment of Wesleyan University, Emory College, and the Wesleyan Female College of Georgia; and gave $100,000 to the Long Island Historical Society. His total known benefactions amounted to some $2,000,000. His collection of paintings, at one time widely known, was dispersed by public sale.

SÊNG- (or **SUNG-**) **KO-LIN-SIN,** sŭng'-kō'-lēn'-sēn'. A famous Mongol general, a prince of the Kortchin tribe, who distinguished himself in connection with the advance in 1853 of the Taiping rebels, whom he defeated twice in battle. In 1860 he was chosen to oppose the advance of the Anglo-French punitive expedition to Peking and is noted particularly in connection therewith for the great circular mud rampart with which he surrounded Tientsin at a distance of 2 miles, and still known to foreigners as "Seng-ko-lin-sin's folly." (See TIENTSIN.) In operating against the Nienfei rebels in central China in 1864 his army was overwhelmed by superior numbers, and he was killed.

SENGO'RA. A Siamese seaport on the east coast of the Malay Peninsula, about 475 miles south of Bangkok (Map: Siam, D 5). Its harbor is spacious and well sheltered, and there is a considerable trade in fish, fruit, and tin. A wireless station on the Telefunken system is maintained here by the Siamese navy. The population is estimated at about 10,000. The Chinese founded a settlement here early in the nineteenth century.

SENIGALLIA, sā'nē-gäl'lē-ä, or **SINIGAGLIA,** sē'nē-gä'lyä. A city in the Province of Ancona, Italy, at the mouth of the Misa, 16 miles by rail west-northwest of Ancona (Map: Italy, D 3). It is modern in appearance, having broad streets and well-built houses. It has a seminary, a technical school, and a library. The industries are silk spinning, sugar refining, and fishing. The famous annual fairs are still well attended. Senigallia was founded by the Senonian Gauls (whence the ancient name, Sena Gallica) and colonized by the Romans in 285 B.C. During the Middle Ages the Guelph and Ghibelline wars left the city in a ruined condition. At Senigallia on Dec. 31, 1502, Cesare Borgia treacherously put to death a number of nobles

of the Papal States whom he had enticed there under a pretext of concluding peace. In 1521 the town became a papal possession. Pop. (commune), 1901, 23,156; 1911, 24,785 (town, 5556).

SEN'IJEX'TEE. See COLVILLE; LAKE INDIANS.

SENIL'ITY (from Lat. *senilis*, belonging to old age, from *senex*, old). The period of old age. In man the decline of life and the approach of old age are marked by certain anatomical, physiological, and pathological phenomena, as well as by mental changes. In extreme old age the sexes are less sharply differentiated than during middle life and tend to approach the neutral type. The voice of the male becomes higher, that of the female lower, in pitch. The male pelvis becomes wider and may equal that of the female. The loss of teeth, atrophy of the lower jaw, a set facial expression, in both sexes, the thinning of the facial hair in man, its increase in woman, all tend to make them lose their distinctive character. The anatomical alterations due to old age are observed throughout the whole organism. The bones become brittle from the deposit of inorganic matter at the expense of organic material. They break easily and knit slowly. There is a loss in height due to shrinking and compression of the intervertebral disks, flattening of the pelvis, and sinking of the arches of the feet. The cartilages are wasted, calcified, or ossified, and the joints tend to become stiff and rigid. The muscular changes are those of atrophy with fatty deposit. With the exception of the heart, all the viscera, including the brain, are reduced in volume. But the most important senile phenomena take place in the circulatory system. In the arteries there is first an overgrowth of connective tissues, thickening of the inner coat, diminution of calibre, and loss of elasticity. These changes are followed by fatty deposits and atheroma (q.v.). The entire vessel becomes thick, hard, and tortuous, and the heart is hypertrophied from the great force required to propel the blood through the stiff, contracted arteries. The stomach walls are thinned, the mucous membrane and peptic glands atrophied. In the intestine there is a waste of the muscle fibres and atrophy of the villi. Anatomical changes in the brain are mostly confined to the cerebral cortex and are those characteristic of atrophy and degeneration. There is a loss of weight estimated, in the average brain, at about 100 grams at 80 years of age.

The physiological changes are dependent to a large extent on the anatomical alterations. Aëration of the blood is deficient, and the loss is due to decreased expansibility of the chest and of the lungs themselves. The loss of teeth, impairment of the gastrointestinal secretions, and muscular atony of the stomach and intestines necessitate an adaptable diet, soft, easily digested articles being demanded. The special senses become less acute. The eye loses its accommodative ability (see SIGHT, DEFECTS OF); impairment of hearing is more or less marked; the senses of smell and taste are blunted and sometimes perverted. Hand in hand with the gradual abatement of physical vigor comes a decrease in mental activity. Loss of initiative and mental endurance are noted. The individual's capacity for brain work is diminished, although there may be, at first, no falling off in quality. Memory for recent events is fleeting, but youthful impressions and experiences are reproduced in startling vividness. Mental interests are narrowed, finally centring upon the individual himself. His small personal needs and comforts assume great importance in his eyes.

The pathological condition which apparently lies at the base of all senile mutation is a general fibrosis. The normal connective tissues multiply at the expense of the functionating cells, which are gradually squeezed out of existence. This change begins earliest and has its most profound effect in the circulatory system. Nearly all cases of death from old age are complicated by arteriosclerosis (q.v.), and the end is most apt to be brought about by circulatory disease or brain lesions depending upon it, such as embolism, thrombosis, cerebral hemorrhage, and the like. The respiratory apparatus of the aged is always enfeebled. Chronic bronchitis and emphysema are very common, and broncho-pneumonia is prone to follow attacks of bronchitis or grippe. Of special diseases, gout and rheumatism of the chronic type are very common in the aged. Epidemic influenza, or grippe, is accompanied by profound prostration, and in the period between 40 and 60 gastric disturbances should excite a suspicion of cancer, but after 60 the condition is more likely to be simply one of senile gastric catarrh.

Search for the ultimate causes of old age has been fruitless, although many plausible theories have been advanced. Aging is a manifestation of every form of life. Even the lowest types, such as the infusoria, exhibit senile phenomena which result in death. Some of the theories which endeavor to account for these changes deserve a brief review. Demange considers the cause as "a change in the quantity and quality of the interstitial nutritive material due to changes in the circulation," this in turn depending on atheroma and arteriosclerosis. Going back to first causes, he considers that the constant friction of the blood upon the inner coat of the vasa vasorum irritates the endothelium, resulting in endarteritis, thickening of the inner coat, and diminution of the calibre of these minute vessels. The nutrition of the larger vessels is similarly reduced, and they begin to degenerate, and so the process goes on. Thoma's theory is that the ceaseless activity of the heart and blood vessels weakens their elastic fibres, and the loss of tone thus occasioned permits dilation of the vessels with slackening of the circulation. The theories which are finding wide acceptance at the present time are those of Metchnikoff. One theory is that the wasting in advanced age is due to the destruction of tissue cells by macrophages, a species of leucocytes. A second theory, that of auto-intoxication through the absorption of poisonous materials from the lower intestine, has been the subject of much discussion; but neither of Metchnikoff's theories satisfy searching scientific analysis. See METCHNIKOFF.

The precautions to be taken against the rapid advance of age include the exclusion of alcohol; moderate eating, especially after the age of 40; moderate exercise after the age of 60 is reached or after senescence has begun to manifest itself; avoidance of strain, physical or mental; proper clothing for all seasons and conditions and other precautions against exposure; together with out-of-door air and a diversity of mental interests.

Consult: C. S. Minot, *Problems of Age, Growth and Death* (London, 1908); Robert Soundby, *Old Age, its Care and Treatment in Health and Disease* (ib., 1913); I. L. Nasher, *Geriatrics* (Philadelphia, 1914). See LONGEVITY.

SE'NIOR, Nassau William (1790–1864). An English economist, born in Berkshire. He was educated at Eton and Magdalen College, Oxford, where he graduated in 1811. In 1819 he was called to the bar at Lincoln's Inn. In 1825 he was elected to the Drummond professorship of political economy at Oxford. He held it for the statutory term of five years. In 1832 the enormous evils of the poor-law administration in England led to the appointment of a commission of inquiry. Senior was one of the commissioners, and the portion of the report in which the abuses of the existing system were detailed was drawn up by him. This report encouraged the Whig government to bring in the Poor Law Amendment Act of 1834. In 1836 he received the appointment of master in Chancery and in 1847 was reëlected to his former professorship for another term of five years. His "Outline of Political Economy" was originally published in the *Encyclopædia Metropolitana* (1850). In this work and in various essays he developed the economic doctrines laid down by Ricardo and the free-trade school with much felicity of expression, which entitles him to rank as the foremost economist between Ricardo and Mill. Senior was the first writer to demonstrate clearly the subjective ground of interest payment ("abstinence" in Senior's language). His analysis of monopoly is the most important contribution of the classical school to the theory of that subject.

SENJIRLI, sĕn'jĭr-lē'. The name of a Kurdish village in north Syria under Mount Amanus, 40 miles northeast of Alexandretta. The hill or *tell* on which the village lies is one of several hundreds in that region which scholars have recognized as marking the sites of ancient cities. In 1883 Dr. von Luschan pointed out the eligibility of this site for excavation, and when in 1888 the Germans formed their Orient-Gesellschaft, Senjirli was selected for the first operations. In the same summer an expedition was sent out, followed by a second in 1890 and by a third in 1891–92, all of which were under the direction of Von Luschan except that Dr. Humann acted as director in the beginning of the first campaign. Among other scholars participating were Euting and Koldewey. The excavations uncovered the remains of an ancient city, which was surrounded by two walls, while the inner acropolis was defended by two or three lines of fortification. The massive character of these structures, especially of the gates and of the sculptures, showed that the expedition was making the first excavation of a city originally Hittite, and it is thought that the outer wall dates from the eighth century, the inner from the thirteenth century B.C. A more recent part of the city was also discovered which is evidently Aramaic in character. The first important find in the way of inscriptions was a monolith of Esarhaddon, King of Assyria, one of the largest known, remarkable for its rich sculpture and for details of religious value, containing a cuneiform inscription of 59 lines in which the monarch celebrates the triumph of his second campaign against Egypt (c.670 B.C.). Aramaic inscriptions were found which are of great value for the additions they make to our knowledge of Syrian politics and civilization. The earliest of these is the Hadad inscription found in the neighboring village of Gerjin. This is written on a cylinder of dolerite of original height of 4 meters and of 2.5 meters circumference, surmounted by the bust of the Syrian god Hadad. On the lower part is an inscription of 34 lines, the characters of which are almost identical with those of the Moabite Stone; in it a certain Panammu, King of Ja'di, celebrates his god. It is in a dialect which still preserves much of the Canaanitish and belongs to the first half of the eighth century B.C. Another similar monument, now a torso, contains in a field of 1 × 1.5 meters an Aramaic inscription of 23 lines, in which a king of Sam'al records the history of his father, Panammu (different from the one above mentioned, but probably of the same dynasty). This and some smaller inscriptions refer to the suzerainty of Tiglath-pileser IV (745–728 B.C.), whose own monuments also speak of Sam'al, so that we are able to date the monument—a connection of immense value to epigraphy and philology—and also to locate the ancient state of Sam'al, whose political and social conditions are interestingly described on this stone. Some Hittite inscriptions were also found. Consult: *Ausgrabungen in Sendschirli* (4 vols., Berlin, 1893–1911); Craig, in the *Academy* (London, 1893); D. H. Müller, in the *Contemporary Review* (ib., 1894); Lidzbarski, *Nordsemitische Epigraphik* (Weimar, 1898); Benzinger, in Baedeker's *Palestine and Syria* (5th ed., Leipzig, 1912).

SENKOVSKI, sĕn-kŏf'skĕ, Ossip Ivanovitch (1800–58). A Russian Orientalist and historian, born near Vilna and educated in that city. He was professor of Oriental languages in the University of St. Petersburg from 1822 to 1847. In 1834 he founded a periodical called the *Reader's Library,* in which, as well as in the *Son of the Fatherland,* several of his novels appeared under the pseudonym Baron Brambeus. He translated Morier's *Hajji Baba* (2d ed., 1845) and wrote *Collectanea,* a series of selections from Turkish authors on the history of Poland (1824–25), and *Supplément à l'histoire des Huns, des Turcs et des Mongols* (1824).

SENLAC, sĕn'lăk, Battle of. See Hastings.

SENLIS, säN'lēs'. The capital of an arrondissement in the Department of Oise, France, 33 miles north by east of Paris, on the Nonette River (Map: France, N., H 3). Its walls, erected in the Gallo-Roman period, are still in good condition, and there are also in the vicinity the ruins of an old Roman amphitheatre. The Gothic cathedral of Notre Dame dates from the twelfth century. The twelfth-century church of Saint-Frambourg, the sixteenth-century church of Saint-Pierre, the College of Saint-Vincent, with its twelfth-century abbey church, the town hall, and the archæological museum are also noteworthy. A treaty was concluded here in 1493 between Maximilian and Charles VIII of France, by which the former recovered Artois and Franche-Comté. Pop., 1901, 7115; 1911, 7006. The town was destroyed by the Germans in August, 1914. See War in Europe.

SENN, Nicholas (1844–1908). An American surgeon. He was born in Buchs, Canton Gall, Switzerland, and came to the United States in 1853, settling in Ashford, Wis. In 1868 he graduated from the Chicago Medical College. He practiced medicine in Fond du Lac, Wis. (1869–74), and in Milwaukee (1874–93) and was professor of the principles and practice of surgery in the Chicago College of Physicians and Surgeons (1884–87) and after 1888 in Rush Medical College, Chicago. He served as surgeon-general of Wisconsin and as surgeon-general of the National Guard of Illinois. At the outbreak of the Spanish-American War Dr. Senn was appointed

chief surgeon of the Sixth Army Corps (with rank of lieutenant colonel of volunteers) and chief of the operating staff in the field. In military surgery he was very successful—he did much to improve first aid on the battlefield and contributed on the treatment of gunshot wounds (hydrogen-gas test), etc. Senn held the presidency of the American Surgical Association in 1892 and of the American Medical Association in 1897. Among his writings are: *Principles of Surgery* (1890; 3d ed., 1901); *Tuberculosis of Bones and Joints* (1892); *Syllabus of Lectures on the Practice of Surgery* (1894); *The Pathology and Surgical Treatment of Tumors* (1895); *Tuberculosis of the Genito-Urinary Organs* (1897); *Medico-Surgical Aspects of the Spanish-American War* (1900); *Practical Surgery* (1901).

SENNA (OF. *senne, sene*, Fr. *séné*, from Ar. *sana, senna*, from *sanaya*, to make easy to open). The leaflets of *Cassia acutifolia*, native to central and eastern Africa and known as Alexandrian senna, and of *Cassia angustifolia*, which is cultivated in the regions from eastern Africa to India. This variety is known as Indian senna and Tinnivelly senna. A purgative drug. *Cassia acutifolia* is a half-shrubby plant, about 2 feet high, with racemes of yellow flowers, lanceolate acute leaves, and flat elliptical pods, somewhat swollen by the seeds. It grows in the deserts near Assuan, and the leaves are collected by the Arabs and carried by merchants to Cairo for sale. The active principle of senna is a glucoside, cathartic acid. It acts effectively in about four hours, causing watery movements which contain some bile. It increases both the intestinal secretions and peristalsis and may cause some griping. Excreted with the milk and other secretions, it purges the nursing child. Its best-known preparation is compound licorice powder, but the *United States Pharmacopœia* recognizes a confection, a fluid extract, a compound infusion (black draft), and a plain, an aromatic, and a compound sirup. Senna is valuable in chronic constipation, but should be combined with other laxatives, such as sulphur, and with aromatics. See CASSIA, and Plate of CARMINATIONS, ETC.

SENNACHERIB, sĕn-năk′*e*-rĭb (Assyr. *Sin-ahe-erba*, Sin has increased the brothers). King of Assyria, 705–681 B.C. He succeeded his father, Sargon II, and in 703–702 had to deal with a revolt of the Chaldæan Mardukapaliddin (Merodach Baladan). The latter attempted to involve Hezekiah, King of Judah, in the revolt (2 Kings xx. 12–19). After defeating the Chaldæans, Sennacherib first proceeded against the Kassites and the Ellipians and then, in 701, turned his attention to the west. He captured Sidon, Ashkelon, Ekron, and the neighboring towns and defeated at Eltekeh the Egyptians, who undertook to check his progress. The cities of Judah fell into his hand one after another, and Hezekiah was shut up in Jerusalem, but refused to surrender, though he gave up Padi, King of Ekron, who had been his prisoner, and forwarded to Nineveh a heavy tribute after Sennacherib's departure. It was probably a rumor of serious conditions in Babylonia that caused him at this time to return. In 696, according to Tallquist's computation, Sennacherib undertook a campaign to suppress a revolt in Cilicia, aided, as it seems, by Ionians. In 689 Sennacherib ruthlessly destroyed the city of Babylon. It may have been in 683 that Sennacherib made a campaign against Syria and Egypt (2 Kings xix. 9–37) which ended disastrously, probably because of the outbreak of pestilence in his army. He was murdered by one of his sons according to the Babylonian Chronicle, by two, Sharezer and Adrammelech, according to 2 Kings xix. 37. It is possible that Adadmalik was the private name of Saritir Asur (Shareser), who occupied the throne for a short time in 681. See ADRAMMELECH.

Bibliography. George Smith, *The History of Sennacherib* (London, 1878); R. W. Rogers, *History of Babylonia and Assyria* (New York, 1900); L. W. King, "Sennacherib and the Ionians," in *Journal of Hellenic Studies*, vol. xxx (London, 1910); A. T. Olmstead, "Western Asia in the Reign of Sennacherib," in *Annual Report of the American Historical Association* (Washington, 1911); C. W. H. Johns, *History of Assyria* (London, 1911); R. W. Rogers, *Cuneiform Parallels to the Old Testament* (New York, 1912).

SENNAR, sĕn-när′. A province of Anglo-Egyptian Sudan (q.v.), situated between the White and Blue Nile and extending from Khartum south to Fasokl and known in a wider sense as Dar Sennar (Map: Egypt, C 5). The Province of Kordofan is on the west. The area of Sennar is unknown. It is essentially a plain with isolated mountains dotting its surface. In the southeast it becomes rougher, forming the approach to the Abyssinian highlands. The soil is alluvial and carries gold. Sennar is in the moist zone. The Khartum section of the country has little in the way of vegetation but grasses. In the south are forests. Among the usual trees found are the acacia and the tamarind. Lions, elephants, hippopotamuses, etc., abound. The bog ores yield a good grade of iron. No figures are given for the population, of which the negro race Funj (q.v.) forms a noteworthy part. This race came hither about the year 1500 from Central Africa and founded the Sennar Kingdom, which ceased to exist in 1821. The old capital, Sennar, on the Blue Nile, has about 18,000 inhabitants. It has suffered in the rise of Khartum. Wod Medina and Mesalamia, both on the Blue Nile, are important towns.

SEN′NET. See BARRACUDA.

SENOA, sĕ-nō′à, AUGUST (1838–81). A Croatian poet and novelist of the Romantic and Nationalist school, born at Agram and educated at the University of Prague. He is also known under the pseudonym St. Gênois.

SENS, sănS. An archiepiscopal city and the capital of an arrondissement in the Department of Yonne, France, 70 miles southeast of Paris, on the Yonne River (Map: France, N., J 4). The most prominent edifice of the city is the cathedral of Saint-Etienne. It dates from the twelfth century, but has undergone frequent restorations. It is of the Romanesque and Gothic styles of architecture, the latter being more generally used. The town hall, also a fine structure, has a museum of precious stones, an art gallery, and a library. Manufacturing is the leading industry, the chief products being fertilizers and farm implements. Pop., 1901, 14,962; 1911, 15,034. Sens, the ancient Agenticum, at the time of Julius Cæsar was one of the largest cities of Gaul and still has interesting Roman remains. It was made the seat of an archbishop in the eighth century. The see was changed to a bishopric in 1791, was suppressed in 1801, and was finally restored as an archbishopric in 1807. The

Council of Sens which condemned Abélard and his teachings was held here in 1141.

SENSA'TION (Fr. *sensation*, from Lat. *sentire*, to perceive). A simple element of experience which is conditioned upon some organ of sense. The term is common to functional and structural psychology; but while both could accept the above definition, their interpretations would diverge. (See MIND; PSYCHOLOGY.) For functional psychology, sensations are elementary modes of being conscious. "They are the immediate results upon consciousness of nerve currents as they enter the brain, and before they have awakened any suggestion or associations with past experience." (James.) From this point of view, therefore, sensations are elementary states of knowing; chronologically they are first steps in knowing; in later experience they are built up, by synthetic and other processes, into perceptions or "presentations of sense," and things are perceived as having qualities which are revealed by mental states. Structural psychology, on the other hand, makes no such epistemological reference. For it sensation neither knows nor gives knowledge; it exists in its own right; and the problem of psychology is to describe it as accurately as may be.

The functional or epistemological meaning of the term is loosely employed also by physiology. The brain is regarded as the organ of sensation; but besides this there must be perceptive organs for receiving impressions, and nervous tissues for conducting them to the sensorium. Objective sensations are those excited by some object in the outside world; subjective sensations originate within the brain itself. Sensations are further classified as organic and special. The former include such experiences as hunger, thirst, discomfort, fatigue, satiety, etc.; they are not definitely localized, but they furnish information concerning certain changes in various portions of the body. Special sensations are those which may be referred to special sense organs and through which we gain knowledge of the outside world. Furthermore, certain disorders of sensation are diagnostic of bodily conditions. They are sometimes trifling and temporary, denoting, e.g., a circulatory irregularity, and sometimes lasting, denoting some nervous disease. Among them are anæsthesia, analgesia, and thermoanæsthesia, or loss of sensibility to touch, pain, and temperature respectively; hyperæsthesia and hyperalgesia, the former an excessive sensitivity to stimuli of any sort, the latter to pain only; dysæsthesia, an abnormal sensibility, shown, e.g., when a thrill results from tactile or painful impressions; and paræsthesia, which includes all irregular or morbid sensations except pain, such as numbness, tingling, itching, pricking, formication, coldness, weariness, and abdominal sensations. See NERVOUS SYSTEM AND BRAIN.

Obvious as the functional view of sensation appears, it will not bear the test either of a rigid epistemology or of accurate psychological analysis. In the first place knowledge, in its advance from acquaintance with to knowledge about, does not proceed from bare sensations to complex perceptions. If it is knowledge at all, it is judgment; and the difference between simple and complex judgments is not the difference between sensation and perception. Nor are the intellectual functions built up, in the time order, from the juxtaposition or amalgamation of sensations into perceptions; where there is intellectual functioning there is, from the first, the function of perceiving. In the second place, analysis shows that so-called sensations like thirst, discomfort, satiety, etc., are in fact perceptions, meaningful experiences which are complex and which may be reduced, like other perceptions, to core and context. (See MEANING; PERCEPTION.) As has been said, the sensation of structural psychology is merely existential; it has no meaning, no reference to anything external or internal. It follows that it is a product of analysis and abstraction. The human mind is so complex, and the nervous system is adequate to so large a number of stimuli, that only under the most carefully controlled conditions of the laboratory may we approach to simple experience. But the approach is near enough; we find experiences like cold, red, bitter, b♭, whose distinctive quality can only be named and cannot further be described. And we may, by changing the conditions, find other aspects or attributes (intensity, duration, clearness, extent) which when taken together serve not only to characterize a sensation, but also to mark off sensations from other elemental experiences. These attributes therefore furnish the true psychological basis for a classification of sensations; though it is, in fact, rarely worth while to displace the older and simpler method of classification by reference to the organs of sense.

Consult: E. B. Titchener, *Experimental Psychology* (New York, 1901–05); William James, *Principles of Psychology* (new ed., 2 vols., ib., 1905); W. M. Wundt, *Physiologische Psychologie* (6th ed., Leipzig, 1908–11; Eng. trans. of 5th Ger. ed. by E. B. Titchener, New York, 1905); Oswald Külpe, *Outlines of Psychology* (Eng. trans. by E. B. Titchener, London, 1909); E. B. Titchener, *Textbook of Psychology* (New York, 1910); G. F. Stout, *Manual of Psychology* (London, 1913). See AUDITION, AUDITORY SENSATION; COMMON SENSATION; CUTANEOUS SENSATIONS; KINÆSTHESIS, KINÆSTHETIC SENSATIONS; SMELL; TASTE; VISUAL SENSATION.

SENSA'TIONALISM (sometimes called SENSUALISM). A term used to designate the theory that the total content of consciousness is of sense origin; that all the higher activities of mind, such as judgment and reasoning, are the results left by the impressions originally made upon the *tabula rasa* of the mind by external objects. These impressions, at first unconnected, are supposed to have entered into mutual relation by virtue of the laws of association. (See ASSOCIATION OF IDEAS.) Among sensationalists are to be mentioned the Sophists (q.v.) of antiquity and Hume and Condillac (qq.v.) and their followers in modern times. Locke is a sensationalist with large infusion of rationalism (q.v.) in his doctrines. The classic expression of the principle of sensationalism is given in the Latin sentence, *Nihil est in intellectu, quod non fuerit in sensu.* See HOBBES, THOMAS; KNOWLEDGE, THEORY OF.

SENSE, CHEMICAL, IN ANIMALS. See CHEMICAL SENSE IN ANIMALS.

SENSE AND SENSIBILITY. A novel by Jane Austen (1811). Two sisters, Elinor and Marianne Dashwood, respectively illustrate these two qualities.

SENSE ORGANS. See NERVOUS SYSTEM, EVOLUTION OF THE.

SEN'SITIVE BRIER. See SENSITIVE PLANT.

SENSITIVE PLANT. A common name of certain species of *Mimosa*, particularly *Mimosa*

pudica, so called on account of the irritability (q.v.) of their leaves. Those species which are most irritable are herbaceous or half-shrubby plants with beautifully divided pinnate leaves. The leaflets close upward in pairs when touched, and on repeated or rough touching the leaflets of the neighboring leaves also close together, become depressed, and lastly the whole leaf hangs as if withered. If the stem is shaken, all the leaves exhibit the same phenomena. After a short time the leafstalk rises, and the leaflets expand again. On account of this curious and interesting property some of the sensitive plants are frequently cultivated in hothouses. The same faculty is possessed by the sensitive brier (*Schrankia*), two or three species of which are indigenous to the southern United States, and also by the stamens and styles of many plants, especially of certain cacti. By extension all plants which respond to contact stimuli are said to be sensitive, and in the widest sense all plants may be included.

SEN'SITIV'ITY (from *sensitive*, from OF., Fr. *sensitif*, from Lat. *sentire*, to perceive). A term used in psychophysics, meaning "the bare capacity of receiving and communicating sensations." It is subdivided into modal sensitivity (having reference to a whole sense department) and sensibility (having reference to individual sensations). Modal sensitivity is measured by the number of sensations possible to a given sense. Since sensations may be investigated with regard to their different attributes (quality, intensity, extent, duration), we may further speak of a qualitative, intensive, extensive, and temporal sensibility. Consult G. T. Fechner, *Elemente der Psychophysik* (Leipzig, 1889), and Oswald Külpe, *Outlines of Psychology* (Eng. trans. by E. B. Titchener, new ed., London, 1909). See LIMEN.

SENSITIVITY, DIFFERENTIAL. See DISCRIMINATION, SENSIBLE.

SEN'SUALISM. A term used (1) as a synonym of sensationalism (q.v.), and (2) to denote the practical attitude towards life characterized by a preference, on principle or from inclination, for the sensual pleasures as opposed to the higher interests of art, science, or religion.

SENTENCE (Fr. *sentence*, Lat. *sententia*, opinion, from *sentire*, to perceive). In grammar, an expression of articulate speech, either oral or written, which is, in the judgment both of the speaker and hearer, an organic whole. The sentence is divided into two parts, the subject and the predicate. The subject is that of which something is predicated; the predicate is that which is stated or asked concerning the subject. It is, however, possible to have a sentence in which the predicate or, more rarely, the subject is suppressed, if it may be readily supplied. This usage is characteristic of the interrogative, imperative, and exclamatory types, though some scholars deny that such sentences are real sentences. From this view the most primitive form of sentence is probably the assertive or predicative, as *He comes*. From this type was developed the dubitative or potential sentence, *Perhaps he comes*, and the interrogative type, *Does he come?* Here may be seen the subjectless sentence in such an expression as *Come?* with the answer, *Not he*, or (*Is*) *he* (*coming*)? with the answer, *No, she*. The question of the origin of the imperative type of sentence, as *Stop! John!* is a difficult one. It seems on the whole most probable that this was the most primitive of all forms of the sentence, for the imperative mood and the vocative case were originally mere interjections, the most primitive forms of speech. See INTERJECTION; LANGUAGE.

The relation of the subject matter of a sentence to its verbal form is studied most explicitly in logic, where propositions are classified according to the nature or degree of their predications. The main differentiations of propositions in traditional logic are into affirmative and negative—*He comes, He does not come*—and into categorical, hypothetical, and disjunctive—*He comes, If he comes we shall see him, He may or he may not come.* The logical elements of a predication, the subject, copula, and predicate, correspond very closely to the grammatical elements of the sentence and seem to furnish a basis for the analysis of grammatical forms. In certain modern logical developments, however, theories of judgment consider all propositions as predicates whose subject is reality or the orderly system of human knowledge. According to this view there is a tacit predication in every complete expression. Propositions, or rather judgments, are then graded upon a psychological scale of belief and certainty—the interjection represents the inevitable and unquestioned; the categorical affirmative (or negative) represents a conclusion of certainty after doubt; the hypothetical proposition represents a generalized case, which is certain, provided the hypothetical element be granted or occur; and the disjunction is a predication of uncertainty within the limits covered by the subject matter of the proposition.

Sentences are furthermore classed as simple, compound, and complex. The simple sentence consists of a single subject and predicate, as *He comes*. The compound sentence is composed of two or more subjects and predicates, either of which sets forms in itself a simple sentence and whose parts are normally connected by a conjunction (q.v.), as *He comes here and he goes home*. The complex sentence is either a simple or compound independent sentence, part of which is modified by a dependent sentence, normally introduced by a pronoun (q.v.), but not forming by itself a simple independent sentence, as *He who wishes comes, and he who is eager that more may come goes that he may call them*. The compound or paratactic type of sentence is probably more primitive than the complex or hypotactic sentence.

Bibliography. Hans Delbrück, *Vergleichende Syntax der indogermanischen Sprachen*, vol. iii (Strassburg, 1900); id., *Grundfragen der Sprachforschung* (ib., 1901); W. M. Wundt, *Sprachgeschichte und Sprachpsychologie* (Leipzig, 1901); H. C. Gabelentz, *Sprachwissenschaft* (2d ed., ib., 1901); L. G. Kimball, *Structure of the English Sentence* (new ed., New York, 1904); Hermann Paul, *Prinzipien der Sprachgeschichte* (4th ed., Halle, 1909); W. M. Wundt, *Völkerpsychologie*, vols. i, ii (3d ed., Leipzig, 1911); Leonard Bloomfield, *Introduction to the Study of Language* (New York, 1914). For the logical aspect, consult Bosanquet, *Logic* (2d ed., London, 1911).

SENTENCE, IN LAW. In its broadest legal sense, a judgment or decree of a court or judge; specifically and technically, the act of the court in a criminal case prescribing the penalty after conviction.

When a sentence is finally rendered according to law, the power of the court to punish the prisoner is at an end, but the sentence in many

cases may be in the alternative, as where the prisoner is sentenced to pay a fine or in default of that to be imprisoned for a certain period. When the sentence by its terms imposes a greater penalty than the law allows, that part of it which is within the law will stand as a valid sentence; and, if it be void for such excess or for other formal defect, the court may resentence the criminal because the previous judgment was not a valid one, and therefore in law did not constitute a sentence. In this respect the sentence is notably distinct from the verdict, a defect in which cannot be remedied by again subjecting the prisoner to trial. See JEOPARDY.

When the sentence is for imprisonment for two or more successive terms, or to the payment of a fine and to imprisonment for conviction of more than one crime, as where the indictment contains counts, or specifications, charging the commission of separate though connected crimes, and the sentence is made up by adding together the legal penalties for the several crimes committed, it is called a cumulative sentence. Where the same offense involves a double penalty, as both fine and imprisonment, and both are imposed, the sentence is not therefore cumulative.

The indeterminate sentence has arisen from the endeavor to shape the law so as to furnish an incentive to convicted criminals to reform. It has been defined as a sentence which is "imposed by the court without fixing a definite period of limitation or term of imprisonment, but which simply directs that the convict be imprisoned or placed in the custody of the prison authorities to be held for not less than the minimum nor longer than the maximum fixed by law for the offense for which the prisoner stands convicted." Such sentences have been found to work well in practice, although their merits have not been fully conceded by all. Such sentences, as above defined, have been upheld as constitutional in some States, as Ohio, Illinois, Indiana, and Massachusetts, but were held unconstitutional in the State of Michigan. See INDETERMINATE SENTENCE; PUNISHMENT.

SENTENCE, INDETERMINATE. See INDETERMINATE SENTENCE.

SENTEN'TIÆ. See the second article GNOME.

SEN'TER, GEORGE (1874–). A British chemist, born in Scotland. He studied at University College, London, and at the universities of Göttingen and Leipzig, receiving his Ph.D. from the latter (1903). Thereafter he was lecturer in chemistry at various English schools and colleges. Besides many papers on chemical subjects he published *Outlines of Physical Chemistry* (1909; 3d ed., 1912) and *Text-Book of Inorganic Chemistry* (1911).

SEN'TIMENT (ML. *sentimentum*, from Lat. *sentire*, to perceive). In psychology, a term sometimes given as a subheading under emotion, but whose precise meaning has not been agreed upon. There are, however, two definitions of importance. (1) Sentiment is a particular disposition or tendency which, according to the situation, determines the mode of emotional response. It differs from instinct, as a condition of emotion, not only in the fact that it is acquired in the life of the individual, but also in the greater variety of emotional reactions which it engenders. For example, a sentiment like friendship is not a specific feeling or emotion; rather is it a tendency to feel pleasure in the presence, desire in the absence, hope or despondency in the anticipation, regret for the loss, admiration for the superior qualities, of a friend. (2) It is a distinctive mental complex, akin to emotion, but less abrupt; it contains a larger ideational component, and it shows the pattern of secondary rather than of primary attention. Genetically regarded emotion is of a lower, more nearly instinctive stage, whereas sentiment represents a higher level, coördinate on the affective side with thought on the side of sensation and image. Thus regarded, sentiments may be classified into the intellectual or logical, the ethical or social, the æsthetic, and the religious sentiments. Consult: E. B. Titchener, *Textbook of Psychology* (New York, 1910); G. F. Stout, *Manual of Psychology* (London, 1913); A. Shand, *The Foundations of Character* (ib., 1914). See EMOTION.

SENTIMENTAL JOURNEY, A. A series of sketches by Sterne (1768). The work is based upon some of Sterne's experiences in southern France.

SEN'TINEL (OF., Fr. *sentinelle*, sentinel, watch, little path, dim. of OF. *sente*, path), SENTRY. A soldier posted in some responsible position to guard or protect the place, persons, or property. The duty of a sentinel is one of the most important responsibilities of military life. In the United States army, post and camp guards are relieved every 24 hours, and, except in emergencies, privates are not detailed for guard duty more than once in five days. During their tour of duty each sentinel is subject to the orders of the commanding officer, the officer of the day, and the officers and noncommissioned officers of the guard only, and all persons, of whatever rank, are required to observe respect towards him. He must not permit more than one of any party to approach him for the purpose of giving the countersign. The punishment for any dereliction of sentry duty is very severe and in actual war may involve the death penalty. See GUARD; OUTPOST.

SENUSSI, *se-nōō'sē*, MOHAMMED IBN ALI EL (1791–1851). The founder of the Senussian Order. He was born near Mostaganem in Algeria, and his followers claim that he was a descendant of Hasan, Ali, and Fatima. Under the influence of Wahabism (see WAHABIS) he organized in 1837 a brotherhood for the purification and propagation of Islam. With the support of Mohammed Sherif, the Sultan of Wadai, he built the Zawiya Baidan, or White Monastery, at Jaghabub in the Cyrenaica in 1843. His son, Sidi el Mahdi, who succeeded him in 1859, refused to recognize Mohammed Ahmed, the Sudanese Mahdi (q.v.), and denounced him as an impostor. Under his leadership the order spread; *zawiyas* were established in Damascus, Constantinople, India, and elsewhere. The secret organization has now more than 100 centres, including a strong one at Mecca, where many pilgrims from all parts of the world are initiated. It is more aristocratic than other brotherhoods of the dervish type (see DERVISH) and has been able to maintain its independence of the civil authorities. Sidi el Mahdi died in 1902. The present head is Sidi Ahmed el Sherif. His proclamation of the holy war against Italy was published at Cairo in *el Mu'ayyad*, Jan. 29, 1912. After Italy had joined France, England, and Russia in the Great European War, in May, 1915, the order assumed a more and more friendly attitude towards Turkey.

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SEOUL, sĕ-o͞ol′, or SÖUL, sē-o͞ol′ *or* sä′-o͞ol, more properly HANYANG. The capital of Korea, about 3 miles from the north bank of the river Han and about 19 miles in a direct line east-northeast of Chemulpo, its port on the Yellow Sea (Map: Asia, O 5). It lies in a basin surrounded by rugged hills, and several lofty rocky crags rise within the city. The city proper is inclosed by a high wall 20 to 30 feet high, having a circuit of about 11 miles and pierced by eight gateways. It is divided into four sections by two broad avenues, intersecting at right angles. The remaining streets are mostly narrow and crooked lanes. The houses are as a rule low mean dwellings, a large proportion of them mere hovels. The principal edifices are the old and the new royal palaces, the former of which is an extensive group of well-built granite structures surrounded by beautiful parks. Other notable buildings are a temple of Confucius, the temple of royal ancestors, and a Roman Catholic cathedral. Seoul has an electric-light plant, and an electric street railway runs to the river port, Riong-san. The Han has not sufficient depth to give access for large vessels, but a railway connects the city with Chemulpo. Seoul has railway communication with Fusan and with Wiju. There is telegraphic communication with the principal cities of the province and with the outside world. There are several schools for the teaching of foreign languages. Seoul was made the capital of the Kingdom of Korea in 1392 and was opened to foreigners in 1883. The population has greatly increased in recent years; in 1914 the urban prefecture of Seoul was reported to have 302,686 inhabitants (of whom 50,291 were Japanese).

SEPARATE ESTATE (Lat. *separatus*, p.p. of *separare*, to separate, from *se-*, apart + *parare*, to prepare). The real or personal property of a married woman held by her independently of the interference and control of her husband or his creditors, by virtue of the intention of the grantor that she alone control such property and derive benefit therefrom. At common law, because of the so-called marital unity, all the chattels in possession of the wife at the time of the marriage became the absolute property of the husband; in addition he had the right to receive the whole beneficial interest from her choses in action, provided he reduced them to possession during her life, and he had sole control and management of her real property. Since these rights belonged to the husband they were regarded as assets to be reached by his creditors. The manifest injustice of such rules, particularly in instances where persons other than the husband attempted to convey property to the wife free from his control, led the English courts of chancery to evolve by a process of judicial legislation a body of law applicable to property so conveyed to married women. The enforcement of these new rules in chancery may be said to have created separate estates of married women. By the early part of the nineteenth century this process was complete. Thus, it was ultimately held that even the husband himself might be trustee of the separate property of his wife, and such was the result whenever a transfer was made to the wife, intended for her sole benefit, although no trustee was appointed by the transferor. The courts of law did not recognize or enforce rights in reference to the separate property of married women, however, and consequently actions for trespass and conversion would not lie. In England by the Married Women's Property Acts (1870–93) and in most of the United States by various Married Women's Enabling Acts, some passed as early as 1848, but generally during the decade from 1860 to 1870, the common-law rules have been greatly modified, and to-day a married woman has practically the same control over her property, both real and personal, as if she were single. The momentous changes brought about by this legislation at first led the courts generally to a strict adherence to the letter rather than the spirit of these statutes, but amendments were promptly adopted which gave married women complete power of enjoyment, control, and disposition of their property, even to the extent of permitting a transfer from the husband himself. The inchoate right of curtesy still remains in the husband, however, although it may be cut off at any time without his consent by the grant or devise of the wife.

In most of the United States the savings of a wife out of money provided by the husband for household expenses do not become her separate property, but are the property of the husband. Moreover, when property is conveyed to a married woman by an instrument containing conditions and limitations as to possession and disposition, the latter will govern, as the statutes are intended to cover only cases where there is no express limitation of ownership or where property is owned before marriage or acquired by simple gift or devise. Consult George Spence, *Equitable Jurisdiction of the Court of Chancery* (2 vols., London, 1846–49), and James Schouler, *Treatise on the Law of the Domestic Relations* (5th ed., Boston, 1895; abridged ed., ib., 1905). See CURTESY; DOWER; HUSBAND AND WIFE; MARRIAGE.

SEPARATION (Lat. *separatio*, from *separare*, to separate, from *se-*, apart + *parare*, to prepare). A technical legal term, employed to denote a cessation of cohabitation of husband and wife by mutual agreement and without the intervention of a court of law. This is commonly done where husband and wife believe themselves unable to agree from incompatibility of temper, but where there is no cause for an absolute divorce and often no cause for a judicial separation. The parties usually sign a separation agreement, which generally contains provisions for the wife's maintenance by the husband, the disposition and custody of the children, and so on. The law does not favor the separation of husband and wife, and therefore, if the agreement is deliberately drawn up with an intention to live apart at a future time, it will be null and void. However, if the parties are living apart and desire to take this means to avoid disputes as to the amount to be paid for

the wife's maintenance and as to the custody of children, the agreement will be enforced by the courts. Such an agreement does not prevent the parties, at any time, from resuming cohabitation, upon which it becomes void. While a husband and wife are living apart under a separation agreement, the wife cannot bind the husband for her necessaries if he pays the amount stipulated in the agreement; but if that amount be grossly inadequate, the courts may compel him to support her to the best of his ability. As the marriage is not dissolved by such separation, adultery on the part of either is ground for divorce; and, by the weight of authority, the husband may have an action for criminal conversation with the wife, although the damages may be nominal. The statutes of several States prescribe the details to be observed in executing articles of separation. See ALIMONY; DIVORCE.

SEPARATION, JUDICIAL. See JUDICIAL SEPARATION.

SEPARATION OF CHURCH AND STATE. In the most primitive societies known to us there is no division between civil and religious life. The state and the congregation of worshipers of the national gods are conterminous and identical. The ancient Jewish theocracy is but the best-known example of this once universal phenomenon. The Roman Empire broke up the national cults just as Greek philosophy created general skepticism. The idea of universal brotherhood of men, first found in the Stoics, also obtained a hold on later Judaism, and a considerable number of proselytes were made by both philosophy and religion outside of national boundaries. The oriental "mystery religions," Mithraism, the cults of Adonis, Cybele, Isis, and Christianity, were the first to do this on a large scale.

But so natural did the connection of state and church seem to antiquity that no sooner had Christianity become dominant than it assumed the character of the state religion of the Roman Empire. The Pope took the title, and many of the attributes, of the old Pontifex Maximus; the bishops generally had proconsular jurisdiction. Throughout the Middle Ages the thought of mankind was dominated by the idea of one empire and one church. The rulers of the Holy Roman Empire always had a specially close connection with the Roman church. This latter kept the character of a state in many particulars; it had a considerable amount of land under feudal government; it had its own taxes and its own law; its citizens, the clergy, could be tried only by its own courts, whereas many acts of laymen were justiciable by it, and its laws regulated marriage conditions.

The growth of nationalities in the later Middle Ages was bound to cause a conflict with the claims of the church. In England the statutes of Mortmain (1279), of Provisors (1351), and of Præmunire (1353), in France the Pragmatic Sanction of Bourges (1438), and in Germany the enactment of laws against the ecclesiastical domination witness the growth of the conception of a national church. This programme, however, was first carried through by the Reformation, which in all Protestant lands set up the civil government as the supreme head of the church and obliged it to support the dominant sect.

The idea of the separation of church and state can be found in writings of the sixteenth century, e.g., in the *Utopia* of Thomas More and in isolated passages of Luther's works. But it was not the principle on which either the English Catholic chancellor or the German reformer acted. Among minor sects, such as the Anabaptists, it was more consistently maintained. As a practical programme to be striven for it was first clearly enunciated in 1580 by the founder of Congregationalism, Robert Brown.

It was in North America that a complete division was first made between the ecclesiastical and the civil polity. In the very earliest Colonies the prevalent religion was established. Thus, in Massachusetts, Connecticut, and New Hampshire the Congregational clergy were supported partly by grants of public land, partly by a tax levied by each township on its householders. In the seventeenth century each taxpayer was allowed to designate to the support of which sect he wished his contribution to go. Roger Williams, on being expelled from Massachusetts, founded in 1636 the Colony of Rhode Island, in which, for the first time in history, there was complete equality of all religions and state support to none. Pennsylvania, founded in 1682, also never had an establishment.

The Revolution was partly inspired by the principles of the English and French philosophers, which demanded complete freedom and equality in religious no less than in civil affairs. In 1776 Virginia passed a Bill of Rights and North Carolina a law declaring for complete toleration and disestablishment. In many other Colonies similar measures were taken during or soon after the Revolution. The Constitution of the United States provides, Article VI, Section 3: "No religious test shall ever be required as a qualification to any office or public trust under the United States"; and Amendment 1; "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof." The States sooner or later embodied similar provisions in their constitutions. Connecticut put all religions on an equality in 1818; Massachusetts abolished the tithe in 1811 and finally in 1833 inserted a provision for complete religious freedom in her constitution. Most State constitutions now forbid showing favor to any sect, and some prohibit the granting of money for any religious purpose. And yet it cannot be said that the secularization of government is theoretically complete even yet. Church property is not taxed; various persons have been punished for blasphemy in attacking the dogmas of Christianity; specially favorable terms of incorporation and holding property are allowed to religious bodies; Sunday laws are enforced. But upon the whole these hardly affect the great American principle that government and religion belong to two different categories.

In Canada an Act of 1791 made a large grant of public land "to support a Protestant clergy." The interpretation of these words, which some said meant the Church of England only and some applied to other Protestant denominations, caused a bitter altercation, finally decided in the sense that the Churches of England and Scotland (Presbyterian) should receive support. Since 1840 the separation of church and state has been carried out in most provinces on American lines. In the other British colonies there is no established church.

Mexico secularized ecclesiastical property in 1847 and completely disestablished the church

in laws of subsequent years up to 1874. Her course is remarkable as being the first case of the kind in a Catholic country and for the similarity of her laws to those of France later.

In Brazil the Catholic church had been established under the Empire, but was separated from the state as a consequence of the founding of a republic in 1889. In all other South American states the Catholic church is established and varying degrees of religious liberty allowed, the most in Chile and Argentina and less in the more tropical countries. In Cuba disestablishment followed independence from Spain in 1898.

The first European country to follow the lead of the New World was Ireland. The cause here was found in the special condition by which the Anglican church was established, though the large majority of the people were Roman Catholics. This made the population regard the privileged minority as tyrannical, and in 1871 Gladstone promulgated a law of disestablishment and disendowment. The royal rights to appointments were given up; ecclesiastical corporations were dissolved; privileges and disabilities of the clergy were alike removed; ecclesiastical jurisdiction was abolished. Churches of historical importance were confided to the care of a commission, the others were handed over to the trustees of the now private Anglican corporation. The new Anglican body received from the endowments of the old ecclesiastical property the sum of £5,000,000 in settlement of equitable claims.

A similar law for Wales has recently been carried. This dissolves the connection of the Welsh church with the archdiocese of Canterbury and vests its government in a private corporation. All modern endowments are allowed it, together with a grant of £2,000,000 in settlement of the equitable interests of existing incumbents hitherto paid by the state. This bill has been passed in three successive years (1912–14) by the Commons and twice (1912–13) thrown out by the Lords. According to the constitutional statute known as the Parliament Bill, it was inscribed on the Statute Book (Sept. 18, 1914), but its operation was suspended during the war in Europe and for six months afterward.

Separation in France was brought about by the Law of December, 1905. The movement which culminated then goes back to the time of Calvin and later to the French Revolution. Calvin did not believe in the complete separation of church and state, but thought that those things which were primarily state functions should be exercised by the state alone. (See CALVIN; CALVINISM.) In 1789 the property of the church was declared national property, an act in keeping with the intense outburst of nationalism of the day and also due to the bankruptcy of the state. The Civil Constitution of the Clergy (1790) declared the ministers of religion state officials, to be elected and paid as such. A law of Sept. 18, 1794, abolished payment for the clergy, but recognized existing obligations. By the Concordat (1801) Catholicism was declared the religion of the majority of Frenchmen. In the nineteenth century priests of all religions were paid by the state. The growth of anticlericalism and skepticism was responsible for various laws, notably some passed between 1898 and 1901 for the suppression of monastic orders. In 1905 a law was passed of which the first article guarantees "liberty of conscience and the free practice of religions," and the second reads: "The Republic neither recognizes nor subsidizes any religion. Consequently on and after the first day of January next after the promulgation of the present law will be omitted from the budgets of the state, of the departments and of the communes, all expenses connected with the practice of religions." Pensions were, however, granted to some existing incumbents. Church property was vested partly in the communes, partly in private religious associations, and in the latter case was to be taxed equally with other private property. Religious teaching could be given to children only outside of school hours. Many of the clergy refused to obey the law, and a number of churches were temporarily closed in consequence. Pope Pius X condemned the law in the encyclical *Vehementer nos*, dated Feb. 11, 1906, declaring that it "inflicted grave injury on God, whom it solemnly abjured," that it was a violation of natural right and of treaties, was subversive of justice, and was a grave offense to the apostolic see. (See FRANCE.) In view of the unrelenting hostility of the clergy and faithful Catholics, the government was obliged to supplement the earlier law by one of Jan. 2, 1907, which, while allowing the state to confiscate the property of *menses* and vestries, and otherwise to penalize the clergy for not complying, allowed the churches to be used by the clergy and meetings for worship to be held in them subject merely to the same conditions as any other meetings.

The foundation of a republic in Portugal in October, 1910, was followed in April by disestablishment of the Catholic church. Pensions were granted to the previously salaried clergy, but otherwise they ceased to be paid by the state. Church property was confiscated. Complete toleration was introduced, and the marriage of priests, heretofore forbidden by law, allowed.

There is complete toleration and no state support to any religion in Japan and China (Republican Constitution of May 1, 1914). In the latter country, however, Confucianism is made the basis of ethical instruction in the schools.

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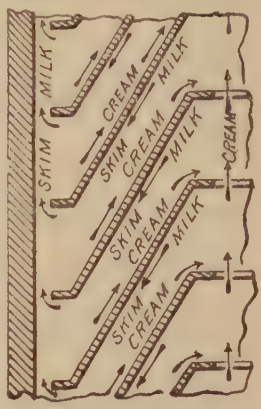
Lauer, *Church and State in New England* (Boston, 1892); S. H. Cobb, *Rise of Religious Liberty in America* (New York, 1902).

SEP'ARATISTS (Ger. *Separatisten*). A religious social organization which originated in Württemberg, Germany, about the beginning of the nineteenth century. Its members, seeking a deeper religious life than prevailed in the Church, and freedom from military service, to which they were conscientiously opposed, and refusing to send their children to the clerical schools, where principles contrary to theirs were taught, were severely dealt with. Aided by members of the Society of Friends in England and led by Joseph Bäumeler (q.v.), they came to America in 1817 and were received by Friends in Philadelphia. In the same year they bought a tract of land in Tuscarawas Co., Ohio, and founded their settlement of Zoar. In their Code of Principles they avow belief in the general doctrines of evangelical Christianity, all ceremonies are banished and declared useless and injurious, honors due to God (such as uncovering the head or bending the knee) are refused to mortals, separation is declared from all ecclesiastical connections and constitutions, the necessity of the political government is recognized, and fidelity to the constituted authorities is professed. Although a rule of marriage was laid down, complete sexual abstinence was held to be more commendable, and marriage was not practiced till about 1830, after which time it became common. Articles establishing a community of goods and interests were adopted in 1819. An act of incorporation for the Separatist Society of Zoar was obtained in 1832. Joseph Bäumeler was chosen the principal executive officer, or general agent, and continued its leader till his death, in 1853. The members of the society were of two classes, novices and full members. The novices or probationers served for one year before being admitted to membership of the second class. Their obligations were renewed on entering into full membership, and in addition the candidate made a full and final surrender of all his possessions. Religious services were held on Sundays, with singing, reading of the Bible, and at the principal meeting a discourse by Bäumeler, or, after his death, the reading of one of his printed discourses, but no audible prayer. Baptism and the Lord's Supper were not recognized. Marriage was not permitted outside of the society. Disputes were settled by arbitration. See ZOAR COMMUNITY.

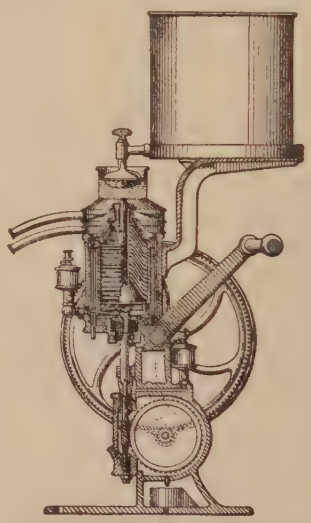
The name is also applied to those who at various times have seceded from the Church of England. See NONCONFORMISTS; ETC. Consult: Joseph Bäumeler, *Die wahre Separation* (Zoar, 1856); Nordhoff, *Communistic Societies* (New York, 1874); E. O. Randall, *History of the Zoar Society* (Columbus, 1900); W. A. Hinds, *American Communities and Co-operative Colonies* (2d rev. ed., Chicago, 1908).

SEPARATOR. See ORE DRESSING.

SEP'ARA'TOR (Lat. *separator*, one who separates, from *separare*, to separate). An apparatus used in dairying to remove the cream from the milk by centrifugal force generated in a rapidly revolving bowl. It supplants the gravity process commonly used. The earliest form of separator consisted of buckets suspended from arms attached to a vertical shaft. When the shaft revolved rapidly the buckets swung out in a nearly horizontal position and the milk in them was separated into layers of cream and skim milk. The modern form consists of a bowl or drum, often fitted with a series of conical plates, capable of being revolved at a high rate of speed and with arrangements for admitting the milk and removing the cream and skim milk. The process of separation is continuous, a steady stream of milk running into the bowl and skim milk and cream pouring out through the respective tubes. The rapidity of separation and the richness of the cream are under the control of the operator. Separators vary in size and in detail of construction. The small separators run by hand separate from 175 to 350 pounds of milk an hour and the larger power machines up to 3000 pounds. When properly run the better makes of both hand and power separators leave only about 0.1 per cent of fat or less in the skim milk. The perfection of the separator has been one of the greatest factors in the development and improvement of dairying (q.v.). See BUTTER MAKING.



SECTION OF INTERIOR OF REVOLVING BOWL.


SECTIONAL VIEW OF DE LAVAL HAND-POWER CREAM SEPARATOR.

SEPHAR'DIM. A designation of the Jews who were driven out of Spain and Portugal and their descendants in France, Italy, Holland, Africa, the Levant, and many other lands. The name is derived from Sepharad. In Obadiah, vs. 20, the exiles from Jerusalem who are in Sepharad are promised possession of the Negeb (q.v.). Separda seems to have been the name of the Province of Phrygia in Achæmenian times, and even in the days of Esarhaddon (681–668 B.C.) this name occurs in connection with the Cimmerian invaders of that region. The Targum ascribed to Jonathan ben Uzziel and the Syriac version understood the word as

referring to Spain. The Sephardim differ from the Ashkenazim (q.v.) in their pronunciation of the Hebrew, in some of their liturgical form, and in their customs, but there is no essential difference in their theology. Consult H. Winckler, in Eb. Schrader, *Die Keilinschriften und das Alte Testament* (3d ed., Berlin, 1902), and Meyer-Kayserling, article "Sephardim," in *The Jewish Encyclopædia* (New York, 1905).

SEPHAR'VAIM (Heb. *Sĕpharvēim*). According to 2 Kings xix. 13, Isa. xxxvi. 19, xxxvii. 13, a city in Syria captured by the Assyrians. It has been identified with Sibraim of Ezek. xlvii. 16, lying between Damascus and Hamath. It seems to be mentioned also in the Babylonian Chronicle (i. 28). The same name occurs also in 2 Kings xvii. 24, xviii. 34, as one of the places from which colonies were brought into Samaria. Some scholars hold that the reading here should be Sippar, the famous North Babylonian city, the present form arising from confusion of the whole text with 2 Kings xix. 13. But the names of the divinities introduced in Bethel by the Sepharvites, according to 2 Kings xvii. 31, Adrammelech (probably Adadmelek) and Anammelech (probably Anathmelek), point to the Syrian city.

SE'PIA (Lat., from Gk. *σηπία*, cuttlefish, sepia). A dark-brown pigment now little used, but formerly much valued as a water color. It is prepared from the black secretion in the ink bag of cuttlefishes in the dry state, consisting of 78 per cent of melanin or black pigment. This substance is agitated in water to wash it and then allowed slowly to subside, after which the water is poured off and the sediment, when dry enough, is formed into cakes or sticks. In this state it is called India ink. A purer form is obtained by boiling the crude black in water, hydrochloric acid, and weak ammonium carbonate. On boiling with caustic alkali, filtering and precipitating with hydrochloric or sulphuric acid, washing and drying, the dark-brown sepia is obtained. It is largely prepared in Italy, great numbers of the species which yields it most abundantly (*Sepia officinalis*) being found in the Mediterranean. India ink is prepared in China, Japan, and India, where it is used both as an ink and as a pigment.

SE'PIOLITE'. See MEERSCHAUM.

SE'POY (Hind., Pers. *sipāhī*, soldier, horseman, from Pers, *sipāh, supāh*, army). A native British Indian soldier. They have been a part of the British forces, irregular and regular, since the middle of the eighteenth century and with the exception of the rebellion have ever been loyal to Great Britain. (For Sepoy Rebellion, see INDIA.) They consist of practically every race and tribe in India and are officered by both natives and Europeans. The higher grades of office are all held by Europeans.

SEPP, zĕp, JOHANN NEPOMUK (1816–1909). A German Catholic Church historian, born at Tölz, Bavaria. After studying philosophy and theology in Munich and visiting the East (1845–46) he became professor of history at the University of Munich, was deposed and expelled from the city in 1847, reinstated in 1850, and, for personal reasons, retired in 1867. (Consult his *Denkschrift in Sache meiner Quieszierung*, 1868.) Sepp was elected to the Frankfort Parliament in 1848, to the German Customs Parliament in 1868, and to the Bavarian Chamber in 1849 and 1869. In 1872 he was sent by the German government to Palestine. He was an enthusiastic advocate of a united Germany. His principal writings include: *Das Leben Jesu Christi* (1842–46; 4th ed., with Daniel Haneberg, 1898–1902); *Das Heidenthum und dessen Bedeutung für das Christenthum* (1853); *Jerusalem und das heilige Land* (1862–63); *Thaten und Lehren Jesu in ihrer weltgeschichtlichen Beglaubigung* (1864); *Geschichte der Apostel vom Tode Jesu bis zur Zerstörung Jerusalems* (1865); *Altbayrischer Sagenschatz* (1876); *Der bayrische Bauernkrieg* (1884); a biography of Görres (1896); and numerous contributions to the local history of Bavaria.

SEPPHORIS, sĕf'ô-rĭs (Heb. *Sippōri* or *Sippōrīn*). A city of Galilee, famous in later Jewish history, the modern Saffuriye. It lies on the slope of a high hill 3 miles west of Cana of Galilee, in a region once famed for fertility. The place is not named in the Old Testament, but is identified by the Talmud with Kitron (Judg. i. 30). It is first mentioned by Josephus for the date 104 B.C. He speaks of it as "the greatest city in Galilee and built in a very strong place." Gabinius made it the capital of Galilee (about 57 B.C.). Originally a strong Jewish centre, Varus expelled the Jewish element (4 B.C.), and it became for a time predominantly Gentile. Herod Antipas handsomely rebuilt it, and it alternated with his other creation of Tiberias as the Galilean capital. In the Jewish revolt it was plundered by Josephus. Under Antoninus Pius it was called Diocæsarea and had the right of coinage. It is famous in the history of the Talmud as the residence for 17 years of Rabbi Judah ha-Nasi, the compiler of the Mishna (died 216 A.D.), who made it the great school of Galilee until the rise of that of Tiberias. It thus became again a centre of Jewish life and was the scene of a Jewish insurrection in 339 which caused its destruction by the Romans. It was early regarded as the scene of the annunciation to the Virgin Mary and the home of her parents. Considerable remains of a large Crusader church exist. Consult the *Survey of Western Palestine*, vol. i (London, 1881); Benzinger, in Baedeker's *Palestine and Syria* (5th ed., Leipzig, 1912); for Talmudic references, Neubauer, *Essai sur l'histoire et la géographie de la Palestine* (Paris, 1867); and for Greek references, Emil Schürer, *Geschichte des jüdischen Volkes in zeitalter Jesu Christi*, vol. ii (4th ed., Leipzig, 1907; Eng. trans. of 1st Ger. ed., New York, 1896).

SEPPUKU, sĕp'pōō'kōō. See HARA-KIRI.

SEPTA'RIA (Neo-Lat. nom. pl., from Lat. *septum*, hedge). Ovate nodules of argillaceous limestone or clay ironstone, usually divided into angular fragments by reticulating fissures that have been filled with calcite or barytes. The fissures are due to cracking of the nodule while drying. Some organic substance, such as a plant or shell, is frequently found in the interior of septaria and evidently formed the nucleus about which the mineral materials were deposited from solution.

SEPTEMBER. See MONTH.

SEPTEM'BRISTS (Fr. *Septembriseurs*). The name given to the perpetrators of the September massacres in the prisons of Paris, Sept. 2–7, 1792. See FRENCH REVOLUTION.

SEPTEN'NIAL ACT (from Lat. *septennium*, space of seven years, from *septennis*, of seven years, from *septem*, seven + *annus*, year). An Act of the English Parliament passed in 1716

fixing the parliamentary term at seven years. Since 1694 the term had been three years, but, on account of the inconvenience of general elections at such short intervals and the desire of the Whigs to secure steadiness and fixity of political action by maintaining themselves in power, the longer term was substituted. Moreover, the fear on account of the Jacobite revolt rendered it unsafe for the Whig ministry to run the risk of a general election. The right of a Parliament to perpetuate its own existence beyond the legal term was the subject of general opposition and was violently contested. The septennial law is still in force, although by usage the length of a Parliament seldom exceeds six years.

SEPTET, sĕp-tĕt′ (from Lat. *septem,* seven). In music, a composition for seven voices or instruments. Instrumental septets are almost invariably cyclical works in sonata form. Beethoven's famous septet (op. 20) is written for violin, viola, horn, clarinet, bassoon, cello, and double bass; but there is no general specification as to what instruments shall be used in the septet.

SEPTICÆMIA, sĕp′tĭ-sē′mĭ-ȧ (Neo-Lat., from Gk. *σηπτικός, sēptikos,* putrefying + *αἷμα, haima,* blood), Sepsis, or Septic Infection. A diseased condition of the body due to absorption of bacteria and their circulation in the blood. It is commonly termed blood poisoning and was thought to be due to entrance of decomposed tissue into the blood. It is now definitely known to be produced by the bacteria streptococcus and staphylococcus. It is to be distinguished from toxæmia on the one hand and pyæmia (q.v.) on the other. Toxæmia is properly used to designate a systemic condition in which the poisons or toxins alone of pathogenic bacteria present in the body are absorbed and diffused throughout the body by means of the blood and lymph. In septicæmia not only the poison, but also the bacteria themselves are distributed through the body through the same channels. In pyæmia not only are both toxins and bacteria present in the blood, but the latter find lodgment in different parts of the body, there to set up new foci of infection. The microorganisms responsible for septicæmia are the same as those concerned in the production of pyæmia. The bacteria, in most cases streptococci, may usually be found in the blood. When septic infection results from an external wound, the wound itself is likely to show evidence of more or less infection, while red streaks running along the course of the veins and lymphatics show the course which the infection has followed. In severe cases œdema of the tissue surrounding the wound may develop.

Septicæmia is a surgical disease. It was frequent in surgical wards of hospitals in preantiseptic days. It always follows infection of an open wound.

Puerperal (see Puerperal Fever) septicæmia, or childbed fever, owes its origin to infection with streptococcus through the bleeding surfaces of the newly emptied uterus. The symptoms of septicæmia are a chill or a succession of chills, a high fever of the remittent type, with delirium, prostration, and rapid emaciation. In the treatment of the condition prompt drainage of the primary focus, as well as secondary foci when accessible, is demanded, the patient's strength being kept up with whisky and similar stimulants. The antistreptococcal serum has proved efficacious in a few cases. (See Serum Therapy.) Sepsis may occur during pneumonia, tuberculosis, mastoiditis, typhoid fever, and many other diseases, in which ulceration or an open wound offers entrance to bacteria when the microörganisms and their toxins of these diseases are the causes of septicæmia.

SEPTIC TANKS. See Sewage Disposal.

SEPTIM′IUS SEVE′RUS, Arch of. A well-preserved triumphal arch in the Roman Forum, at the end of the Sacred Way, erected in 203 A.D. by the Senate to commemorate the conquest of the Parthians and Arabians, and dedicated to the Emperor Septimius Severus and his sons Caracalla and Geta. The arch is 75 feet high and 82 feet broad, with three passageways connected by a cross passage. On each face of the arch are four Composite columns on pedestals, bearing groups of prisoners taken in battle. Above the outer arches are panels representing in low relief the eastern campaigns of Severus. The name of Geta was removed from the inscription on the arch after his murder in 212, and the space filled by a laudatory addition to the name of Severus and Caracalla. The arch during a part of the Middle Ages served as a stronghold, and in the seventeenth century the side passages were rented as shops. The surrounding rubbish was partially removed in 1803 by Pius VII.

SEPTIMOLE, sĕp′tĭ-mōl. In music, the same as septuplet (q.v.).

SEPTUAGINT, sĕp′tū-ȧ-jĭnt (from Lat. *septuaginta,* seventy). A designation of the most ancient Greek version of the Old Testament, derived from the tradition, based on the Letter of Aristeas (q.v.), Philo, and Josephus, that it was made by 72 translators in 72 days at the order of Ptolemy II Philadelphus (285–247 B.C.). Since the worthlessness of this tradition is universally recognized, the title is avoided by many scholars. An examination of the work shows that it is by different hands and that different portions date from different times. It was doubtless made for the use of Alexandrian Jews who had gradually lost familiarity with the Hebrew language. The law was probably translated first, and the tradition which ascribes this portion to the time of Ptolemy Philadelphus is thought by some scholars to be correct. The concluding portion may be as late as the last century before the Christian era. The language is the Hellenistic Greek, and the deuterocanonical as well as the canonical books are included. It was held in the very highest repute by the Alexandrian Jews, who regarded it as infallibly correct and inspired, and gradually it found its way into Palestine. It is the version of the Old Testament cited by Philo, Josephus, and the New Testament writers. It was read and interpreted in the synagogues of Egypt for some centuries after the Christian era, was highly esteemed by the early Church, and most of the versions for use in different Christian communities were made from it. It is still in use in the Greek church. Its greatest value at present is for the textual criticism of the Old Testament. For manuscripts and editions and further details, see Bible, *Versions.*

SEPTUM (Lat. *sæptum,* a partition). A medical term designating a thin wall dividing tissues or cavities. See Heart; Nose; Tongue.

SEP′TUPLET (from Lat. *septuplum,* septuple, from *septem,* seven + *-plus,* -fold). A group of seven equal notes, which are to be

performed in the time usually given to four notes of the same kind (in common time) or to six notes (in six-eight time). It is called for by the sign ⌒ placed above the group.

SEPUL'CHRAL BRASSES. See BRASSES.

SEPULCHRAL MOUND (Lat. *sepulcralis*, relating to a tomb, from *sepulcrum, sepulchrum*, tomb, sepulchre, from *sepelire*, to bury). A mound erected as a memorial for the dead. The practice of rearing mounds of earth and stone over the dead may be traced to remotest antiquity and the lowest grades of human culture. The first and earliest type was merely a heap, without a central cavity or much attention to outward form. Here a single corpse is covered with a pile of rocks or a heap of dirt. In the better form the materials are selected and the surface covered with sods or trees. The original mound was conoid or the form of the body, but in later times geometric structures were erected. Then came the log pen, the cyst of rough slabs, the laid-up inclosure, the megalithic cell, the tomb of masonry, and the mausoleum covered with earth. In these various inclosures the dead were doubled up, laid out, heaped in ossuaries, or incinerated, the ashes being mingled with the soil or inurned. The mounds of America furnish a great variety of these sepulchral remains, ranging from the mere heap to the squared pyramid. Great tumuli and barrows are found throughout northern Europe from the British Isles to Ukraine, and they are to be seen in northern Africa and in Asia. See BURIAL; MOUND BUILDERS.

SEPULCHRE, sĕp'ŭl-kẽr, THE HOLY. See HOLY SEPULCHRE.

SEPÚLVEDA, sâ-pōōl'vâ-dâ, JUAN GINES DE (c.1490–1574). A Spanish historian and astronomer, born near Cordova. He studied at Alcalá and, after living in Italy until 1536, returned to Spain as chaplain and historiographer to Charles V and preceptor to his son, afterward Philip II. His early polemical writings against Luther, and against Las Casas on slavery, brought him into prominence. He wrote, in addition to a *Life* of Cardinal Albornoz, *Historiæ Caroli V Imperatoris Libri XXX* and *De Rebus Hispanorum Gestis ad Novum Orbem Mexicumque*. His works were published in 1780 in four volumes by the Royal Academy of History of Madrid.

SEQ'UANI. A tribe of ancient Gaul, described by Cæsar in his *Bellum Gallicum* (book i), that probably was of Celtic stock and inhabited the district later known as Franche-Comté and Burgundy. Their chief town was Vesontio (the later Besançon, q.v.). They took their name from the river Sequana (now the Seine), which had its source within their territory. This district formed a separate province, called Maxima Sequanorum, under the Empire. Consult T. R. Holmes, *Cæsar's Conquest of Gaul* (2d ed., Oxford, 1911).

SE'QUENCE (OF. *sequence*, Fr. *séquence*, from Lat. *sequentia*, sequence, from *sequi*, to follow; akin to Eng. *see*). 1. In liturgics, a hymn introduced in the Middle Ages as a continuation of the Alleluia before the gospel in the mass, probably with the original idea of supplying words for the protracted series of notes known as neumes (q.v.). Sequences were also known, especially in England and France, as proses, because the earlier ones were not metrical. Notker, a monk of Saint-Gall, was the earliest composer of them, and his work spread throughout Europe; by 1500 his beautiful sequence for Whitsunday, "Veni sancte Spiritus," was adopted in at least 150 dioceses and by many religious orders. Adam of Saint-Victor was the principal sequence composer in the second period. The sequences were principally used in the north of Europe; they are rare in Italian and Spanish missals, and the Cistercians and Carthusians never adopted them. In 1570 the revised Roman missal limited the number of sequences to five, including the "Stabat Mater," "Lauda Sion," and "Dies iræ." 2. As a term in the theory of music, a sequence denotes the frequent repetition of a musical phrase, each repetition ascending or descending by a certain interval. Although the older masters frequently used sequences, theorists were unable to explain their exact character. Fétis finally discovered that a sequence is a purely melodic, not a harmonic progression, and that therefore in this particular case the rules of strict harmony must be suspended. Consult: H. A. Daniel, *Thesaurus Hymnologicus* (3 vols., Leipzig, 1841–46); F. J. Mone, *Lateinische Hymnen des Mittelalters* (3 vols., Freiburg, 1853–55); L. Gautier, *Histoire de la poésie liturgique* (Paris, 1886); C. E. W. Brainerd, *Great Hymns of the Middle Ages* (New York, 1909).

SE'QUESTRA'TION (Lat. *sequestratio*, from *sequestrare*, to surrender, lay aside, remove, from *sequester*, mediator, agent, probably from *sequi*, to follow). An equitable process directing a sheriff, or four or more commissioners, to seize and take possession of the property of a defendant, or person in contempt of court, and receive the rents and profits, if any, until some decree or order of the court is satisfied or until litigation in regard to the property is determined. It was employed to enforce the payment of money damages, which are often granted as incidental to the main relief of a court of equity, and to enforce obedience to decrees of the court, where a person was in contempt. In a few States this process is still commonly employed for the above purposes, but in most jurisdictions the process of execution has superseded it, although, unless expressly abolished by statute, the courts of equity may still resort to it in the proper cases. See CONTEMPT; EQUITY; and the authorities there referred to.

SEQUIN, sē'kwĭn *or* sĕk'ĭn (Fr. *sequin*, from It. *zecchino, sequin*, from *zecca*, Sp. *zeca, seca*, mint, from Ar. *sikka*, die for coins). A gold coin, first struck at Venice towards the end of the thirteenth century. It was about the size of a ducat (q.v.) and equivalent to $2.33 American. Coins of the same name, but varying in value, were issued by other states.

SEQUOIA, sē-kwoi'ȧ (Neo-Lat., named in honor of *Sequoya*, or George Guess). A genus of coniferous trees closely allied to the cypress. Only two species persist, both in California. They are the big tree (*Sequoia gigantea*) and the redwood (q.v.) (*Sequoia sempervirens*). The former is the largest American forest tree and one of the largest in the world. The average height of the trees is said to be about 275 feet, although specimens exceeding 320 feet, with a trunk diameter of 30 to 35 feet near the ground, have been measured. The trees are buttressed at base so that they lose their diameter rapidly for a few feet, after which they taper gradually and are frequently 100 to 150 feet without a branch. The wood is light, soft,

coarse-grained, and durable, especially when in contact with the ground. The heartwood is red, turning darker upon exposure; the sapwood is thin and white. The bark of the tree is spongy and fluted, often 2 feet thick. The tree contains little resin and does not burn readily. The big tree is found only on the west side of the Sierra Nevadas, at elevations between 5000 and 7000 feet. It occurs in scattered groves along with other coniferous trees, in no place forming pure forests. These groves, of which there are about a dozen, occur from Placer to Tulare County, a distance of about 250 miles near the centre of the State. The Calaveras and Mariposa groves are the best known. The former contains about 100 trees of large size and a considerable number of smaller ones. The tallest specimen now standing is the Keystone State, which is 325 feet tall, and what is believed to be one of the finest specimens standing is the Empire State, with a circumference of 94 feet. A fallen specimen known as the Father of the Forest was broken in falling, but it is estimated as more than 400 feet tall. The Mariposa grove contains about 500 trees of all sizes, of which perhaps 100 are large specimens. A number of fine specimens are to be found in the State and national forest reserves, but the finest are upon private holdings. The discovery of the first of these big trees has been attributed to a hunter named Dowd in 1850, but it is claimed that John Bidwell actually visited the same grove, the Calaveras, in 1841, and to him should be given the credit of their discovery. The proper botanical name for this tree has been a subject of controversy. In England it is generally known under the name *Wellingtonia gigantea*, but, as the tree does not differ from *Sequoia*, the name was transferred to *Sequoia gigantea*. By some rules of nomenclature the name should be *Sequoia washingtoniana*, but, as the specific name *gigantea* is best known, it is here retained. The tree has been successfully grown in England and elsewhere. Some forest specimens are estimated to be from 1000 to 2000 years old.

SEQUOIA GIGANTEA.

The genus *Sequoia* appeared first in the Cretaceous beds of Atane, Greenland, and in the Potomac group of North America and is represented by later species in the Tertiary of North America and Europe which are very similar to those remnant species now living in the western United States. Still earlier ancestors were *Leptostrobus* and *Swedenborgia* of the Jurassic and *Voltzia* of the Triassic, all of which attained great size. Consult E. C. Jeffrey, "Comparative Anatomy and Phylogeny of the Coniferales: Part i, The Genus Sequoia," in *Boston Society of Natural History, Memoirs*, vol. v (Boston, 1903). See CONIFERÆ; REDWOOD.

SEQUOIA NATIONAL PARK. See PARK, NATIONAL.

SEQUOYA, sē-kwoi'yȧ, or GEORGE GUESS (c.1760–1843). A Cherokee mixed blood, famous as the inventor of the Cherokee syllabary. He was born about the year 1760 and lived as a boy with his mother at the Cherokee town of Tuskegee, close to old Fort Loudon, in east Tennessee. As he grew up he became a hunter and fur trader, but also developed mechanical ingenuity, especially in the making of silver ornaments. He was led by a chance conversation in 1809 to reflect upon the ability of the whites to communicate thought by writing, with the result that he set about devising a similar system for his own people. For this purpose he used a number of characters which he found in an old spelling book, taking capitals, lower case, italics, and figures, and placing them right side up or inverted, without any idea of their sound or significance in English use. Having thus utilized about 35 ready-made characters, he obtained a dozen or more by modifying some of these originals, and then invented others to make a complete syllabary of 85 characters, capable of expressing every sound in the Cherokee language. By this invention any one speaking the language can learn to read and write it in a few days. Since then the same principle has been utilized by missionaries for other Indian languages, notably the Cree and Chippewaian. After years of patient labor in the face of ridicule, discouragement, and repeated failure, he finally perfected his invention and in 1821 submitted it to a public test by the leading men of the Cherokee nation. Its great value was at once recognized, and within a few months thousands of hitherto illiterate Cherokee were able to read and write their own language. In the next year he visited the West to introduce his system among those of the tribe who had removed to Arkansas. On a second visit in 1823 he took up his permanent residence with the Western band. In 1839 Sequoya was instrumental in bringing about a union of feeling between the "Old Settlers," as the Arkansas band was then known, and the body of the nation, which had just then removed from their original territory in the East. Consult Foster, *Sequo-yah, the American Cadmus and the Modern Moses* (Ithaca, N. Y., 1885), and James Mooney, "Myths of the Cherokee," in *Bureau of American Ethnology, Annual Report*, vol. xix (Washington, 1902).

SERAGLIO, sȧ-rä'lyō (It. *serraglio*, inclosure, from ML. *serraculum*, spigot, Lat. *seracula*, dim. of *sera*, bolt, confused with Ar., Turk. *sarai*, from Pers. *sarai*, palace, inn, seraglio). The collection of buildings with surrounding grounds which formerly constituted the Imperial residence of the Sultan at Constantinople. It is situated on the easternmost of the seven hills of the city, between the Sea of Marmora, the Bosporus, and the Golden Horn, and is surrounded by a wall more than 2 miles in circumference. Mohammed II began the erection of a palace on this location in 1468 and occupied it during a portion of the year. Soliman II (1520–66) greatly enlarged it and made it his habitual residence. Since 1839 it has not been occupied by the Sultan and buildings and grounds are falling into decay. The Seraglio consists of two inclosures, an outer and inner; free access is allowed to the former, which constitutes nine-tenths of the whole. Among the buildings in the outer portion are several Imperial schools, a hospital, barracks,

SEQUOIA

MARIPOSA GROVE OF BIG TREES, YOSEMITE VALLEY

and the museum of Constantinople. Among the noteworthy structures of the inner portion are the Hall of the Divan, the Imperial Treasure House and Library, and the Bagdad Kiosk. Certain relics of the Prophet are kept here, among them the black mantle which he is said to have given to the poet Kaab. Annually on the fifteenth of Ramadan the Sultan comes in great state to render homage to this relic. The Turks apply the name "seraglio" (or more properly "serai") to any residence of the Sultan. In English it is often confounded with the word "harem" (q.v.). Consult E. A. Grosvenor, *Constantinople* (2 vols., Boston, 1895), and for a description of the Seraglio in its greatest glory, J. B. Tavernier, *Voyage en Turquie, en Perse, et aux Indes* (Paris, 1677–79).

SERAGLIO, Il. See Entführung aus dem Serail, Die.

SERAING, se-răN′. A town in the Province of Liége, Belgium, on the Meuse, 4 miles by rail southwest of Liége (Map: Belgium, D 4). It has a factory for the manufacture of steam machinery, locomotives, etc., which is probably the largest in the world. The town depends on these works for its prosperity, the company maintaining schools, hospital, orphan asylum, etc. In the vicinity are valuable coal mines and one of the largest glass factories of Europe. Pop., 1900, 39,623; 1910, 42,893.

SERAJEVO, sĕr′ȧ-yȧ-vō, **SARAJEVO,** sȧ′-rȧ-yȧ-vō, or Bosna-Serai, bŏs′nȧ sĕr-ī′. The capital of Bosnia, beautifully situated in the midst of gardens on both sides of the Miljačka, 122 miles southwest of Belgrade (Map: Austria, F 5). The river is here spanned by several fine stone bridges. The town has been greatly advanced by modern improvements. Noteworthy structures are the Roman Catholic cathedral (1889), the large sixteenth-century mosque of Husref Bey, the town hall, the Governor's residence, and the museum with a collection of antiquities. The picturesque ruins of the old castle, erected by the Hungarians in the thirteenth century, crown the height above the town. Serajevo has a Roman Catholic seminary. The principal industry is the manufacture of metal ware. There are also dyeing and silk-weaving establishments, extensive potteries, a large brewery, and a government tobacco factory. Serajevo is an important commercial entrepôt, and the immense bazar is the centre of a very lively trade. It is connected by rail with the Austro-Hungarian railroad system. There are valuable iron mines and mineral baths. Here, on June 28, 1914, the Archduke Franz Ferdinand, heir presumptive to the Austrian Empire, was assassinated, and the event was the proximate cause of the European War. (See War in Europe.) Pop., 1910, 51,919, including the garrison.

SERAMPUR, sĕr′ŭm-pōōr′, or **SERAMPORE.** A town in the Province of Bengal, India, 13 miles north of Calcutta, on the Hugli River. It extends along the river front and is very picturesque. The most prominent feature is the Baptist College, occupying a site overlooking the river. It has a library with valuable manuscripts and a fine collection of portraits. Other objects of interest are the former residence of the Danish Governor, now the government building, and the old Danish church, with its memorial tablets to the early missionaries. Pop., 1901, 44,451; 1911, 46,798. Serampur was a Danish possession, known as Fredericksnagar, until 1845, when it was ceded to the East India Company. It is noted as the centre of the Baptist missionary movement of the early years of the nineteenth century. Ward, Carey, Mack, and Marshman, the leaders of this movement, are buried here.

SERAO, sȧ-rā′ō, Matilda (1856–). An Italian novelist, born at Patras, Greece. She first wrote short sketches for the Neapolitan papers (among them *Il Piccolo*), while also helping her father to edit his own paper. Moving to Rome, she became one of the group which included D'Annunzio and Scarfoglio (later her husband), interested in the publication of the *Capitan Francassa.* Later, with Scarfoglio, she founded the *Corriere di Roma* (afterward *Corriere di Napoli*) and in 1891 founded the *Mattino.* As a novelist she shows in her earlier work unmistakably the influence of the French realists, notably Zola, whose *Ventre de Paris* she follows in spirit as well as title in her *Ventre di Napoli* (1885). In her later novels she devotes herself to psychological problems, which she handles with much subtlety and power. Her defects are those of journalism; her vigor, spontaneity, and sympathy make her always interesting. Among her best works are: *La conquista di Roma* (1885); *Il paese di Cuccagna* (1891); *Addio amore.* In her more recent book, *Al paese di Gesù,* she seems to have joined the neomystic school. In 1901 Serao's *Paese di Cuccagna* appeared in English translation as *The Land of Cockayne;* in the same year, *The Ballet Dancer* (*La ballerina*), and *On Guard, Sentinel* (*All 'erta, sentinella!*); in 1902 *La conquista di Roma* under the title *The Conquest of Rome;* and in 1905 the *Paese di Gesù* as *In the Country of Jesus.* Her later work comprises *Storia di due anime* (1904); *Dopo il perdono* (1906; in English as *After the Pardon,* 1909); *Piccole anime,* charming sketches of children; *I capelli di Sansone; Sterminator Vesevo* (1910). Consult B. Croce, "Matilda Serao," in *La critica,* vol. i (Naples, 1903), and Jean Dornis, *Le roman italien contemporain* (3d ed., Paris, 1909).

SER'APE'UM (Lat., from Gk. Σεραπεῖον, *Serapeion,* from Σέραπις, *Serapis*). A name signifying a temple of the god Serapis (q.v.). Several such temples existed in Egypt, the most remarkable being the Serapeum of Alexandria, said to have been one of the grandest buildings in the world. It was built by Ptolemy I in the suburb of Racotis on the site of an older temple and was richly adorned with sculptures and paintings. The temple was burned down in the reign of Marcus Aurelius, but was soon rebuilt; it was finally destroyed in 391 A.D. by Bishop Theophilus of Alexandria. The serapeum of Memphis (q.v.), situated near the site of the modern village of Saqqara (q.v.), was the funerary temple of the sacred bull Apis. It consisted of an extensive group of buildings, with pylons, an inner and an outer court, and the usual appurtenances of Egyptian temples and was connected by an avenue of sphinxes with a small serapeum of the Greek period, before which stood 11 statues of Greek philosophers and poets arranged in a semicircle. Within the chambers of the Egyptian Serapeum was established a colony of hermits who lived in cells attached to the various chapels of the temple. A regularly organized monastic system prevailed among them, and there can be no doubt that they were the prototypes of the Christian monks and ascetics

of a later period. Below the great temple were the subterranean tombs in which the mummies of the Apis bulls were deposited from the time of Amenophis III, or perhaps earlier, down to the Roman period. The earlier tombs are square chambers, hewn in the rock, and they were connected by shafts with chapels standing above them. In the nineteenth year of Rameses II a subterranean gallery, about 110 yards long, was hewn out and flanked by some 40 chambers, each of which was walled up after receiving the remains of a sacred bull. In the reign of Psammetichus I (q.v.) a new gallery was excavated upon a much more extensive scale, and additions were made to it from time to time by the Saitic and Ptolemaic monarchs. The Apis tombs were opened in 1851 by Mariette, who found some of the mummies still intact in the coffins in which they were buried. Among the many valuable relics found the most instructive were the *Apis steles*, or small tablets recording the exact dates of birth, enthronement, and burial of the sacred animals. These tablets furnish chronological data of the utmost importance; they are dated by the regnal years of the kings under whose rule the recorded events occurred, and they have thus served to determine with precision the duration of the reigns of many Pharaohs and the order in which they succeeded each other. Consult: A. E. Mariette, *Mémoire sur la mère d'Apis* (Paris, 1856); id., *Le Sérapéum de Memphis* (ib., 1857); K. A. Wiedemann, *Religion of the Ancient Egyptians* (Eng. trans., New York, 1897); W. M. Flinders Petrie, *A History of Egypt*, vols. iii, iv (London, 1905). Cf. Plutarch, *De Iside*, and Tacitus, *Hist.*, iv, 84. See Isis and Serapis, Temple of.

SERAPH, sĕr'af (Heb. *sārāph*, pl. *sĕrāphīm*). An order of celestial beings mentioned only once in the Bible (Isa. vi. 2–6). From the description there given it would appear that they were conceived as human in form, having hands, faces, and feet, but having also wings. Of these they had six, or three pairs, with one pair covering their faces, with a second their feet, and flying with the third pair. They are ranged opposite each other and proclaim the holiness of Yahwe. They also carry out His commands. The origin of the word as of the idea is a matter of conjecture. The word is rendered by Jewish commentators "the brilliant ones," but other scholars propose "the lofty ones"; still others would change the text, reading *shĕrāthīm* for *sĕrāphīm*, and translate "ministering ones." So radical a procedure, however, is not called for, and since the underlying stem *sāraph* signifies " to consume with fire," it seems reasonable to connect with the seraphim the notion of purification by fire and to regard them as the agents who bring about such purification—which, as a matter of fact, is the function assigned to them in Isaiah's vision (Isa. vi. 6–8). There is evidently some relationship also between Isaiah's seraphim and the "fiery serpent" (*sārāph*) referred to in Num. xxi. 6 and Deut. viii. 15 (cf. Isa. xiv. 29; xxx. 6), which bites the Israelites in the desert. This seraph appears to have been originally a personification of the serpent-like lightning. The popular notion is transferred by the prophet into the spiritual realm, and in this transfer all traces of the serpentine form disappear. A factor in bringing about this transfer may have been the Egyptian conceptions of winged griffins—called in Demotic texts *serb*—who act as guardians of tombs and temples. It is to be noted that winged men and beasts appear also on the Assyrian monuments. See Cherub.

SERAPHIM, sĕr'â-fim, Order of the. The oldest Swedish order, also called the Blue Ribbon. Its foundation is ascribed to Magnus Ladulås in 1260, and it was renewed by Frederick I in 1748. The decoration, worn on a blue ribbon, consists of an eight-pointed cross with seraphs' heads and patriarchal crosses, bearing the letters JHS with three Swedish crowns.

SERA'PIS, SARAPIS (Lat., from Gk. *Σέραπις, Σάραπις*). An Egyptian deity worshiped especially at Memphis and at Alexandria. The name is a compound of Osiris and Apis (qq.v.) and in its earliest Greek form occurs as Osirapis, of which Serapis (Sarapis) is a corruption. The god, in fact, was the sacred bull Apis, who after his death became one with Osiris and, under the name of Osiris-Apis (Egyptian *Oser-Hapi*), was worshiped as a god of the dead. The Serapeum or temple of Serapis, at Memphis, enjoyed the reputation of special holiness and was visited by pilgrims from all parts of Egypt. The Greeks identified Serapis with their Hades (q.v.), the King of the Underworld, and Ptolemy I built the famous Serapeum of Alexandria upon the site of an older temple of the Egyptian god. This temple seems to have contained two statues of the god—one said to have come from Sinope, the other, representing the god as Hades with Cerberus, brought from Seleucia. The Alexandrian Serapis was therefore a fusion of the Greek and the Egyptian divinities. Under the Romans, when the worship of Serapis spread beyond its original territory, Serapis, rather than Osiris, was regarded as the consort of Isis. Consult: K. A. Wiedemann, *Religion of the Ancient Egyptians* (Eng. trans., New York, 1897); J. P. Mahaffy, *The Empire of the Ptolemies* (ib., 1898); id., *A History of Egypt under the Ptolemaic Dynasty* (ib., 1899); J. G. Milne, *A History of Egypt under Roman Rule* (ib., 1905); Otto Gruppe, *Griechische Mythologie und Religionsgeschichte* (2 vols., Munich, 1906); J. H. Breasted, *Development of Religion and Thought in Ancient Egypt* (New York, 1912). See Serapeum.

SERAPIS, Temple of Isis and. See Isis and Serapis, Temple of.

SERBATI, Antonio Rosmini-. See Rosmini-Serbati, Antonio.

SERBIA. See Servia.

SERBO-CROATIAN LANGUAGE, Servian, or Croatian. The language spoken by 9,000,000 people inhabiting Servia (with Old Servia and part of Macedonia), Montenegro, Bosnia, Herzegovina, Croatia, Slavonia, a part of south Hungary proper, Istria, Dalmatia, and the islands of the Adriatic. The Serbo-Croatian belongs to the South Slavic family of languages. It presents the following phonetic peculiarities, of which examples will be found under the heading Slavic Languages, viz., vocalic *r*, as in *Srbin*, Servian; change of vocalic *l* to *u* and of final *l* to *o*; of the primitive Slavic nasals *ę̆*, *ą̆* to *e*, *u* respectively; of *y* to *i*; of *tj*, *dj* to *ć*, *gj* (also written *dj*); of the groups *-ol-*, *-or-*, *-el-*, *-er-* between consonants to *la*, *ra*, *lĕ*, *rĕ*, etc. The existence of long and short vowels along with a pitch accent makes the Serbo-Croatian one of the most expressive

among the European languages. The accent is free. Morphological features of the modern literary Serbo-Croatian are: in nouns, the formal substitution of the dative singular for the locative singular, and the ending *ima* for the dative, locative, and instrumental plural; in nouns and pronouns, the genitive plural in *â;* in adjectives the comparative in *-ji, ši,* while the superlative is formed by means of the prefix *naj;* in verbs the persistence of the infinitive, aorist, and imperfect, with loss of the first active participles present and preterit. In the syntax we may note the use of the conjunction *da* to introduce object, exhortative, and final clauses. The Serbo-Croatian has borrowed many words from the Old Church Slavic, Russian, Greek, Italian, and Turkish languages.

The dialectal division of the Serbo-Croatian is not definitively settled. The following dialects are named after the particle rendering "what" in each of them: (1) The *kaj* (*kaj* = what) dialect, or Kaikavian (Croatian proper), spoken in north Croatia and northwest Slavonia; it marks the transition to the Slovenian language. (2) The *ča,* or Tchakavian, in Istria, north Dalmatia, and the islands, and on the Croatian coast south and east of the Kulpa River; on the whole this has preserved the old Slavic accentuation. (3) The *što,* or Shtokavian, group of dialects, on the western form of which is based the literary Serbo-Croatian. This is also the most important in numbers and extension. The eastern limit of the Shtokavian proper is formed by the Danube between Servia and Rumania, the river Timok from the Danube to Zaietchar, thence an irregular line passing through Stalać, Prishtina, and Prizren to Dulcigno on the Adriatic. East of this line is another group of dialects, (4) the Old Servian of M. Rešetar, or Prizren-Timok of Professor Belić. This dialect is heard as far east as Vidin, Slivnitsa, and the vicinity of Kustendil. Its southern boundary may be considered to be the line Prizren-Uskub (Skoplie)-Kumanovo-Karatovo to a point east of Kustendil (or Velbuzd). In its extreme eastern and southern forms (the so-called *Torlatchki* speech) this dialect merges into Bulgarian and Macedonian Slavic, just as the various Serbo-Croatian dialects merge into one another. The existence (claimed by Belić) of a special Serbo-Macedonian dialect south of the last-named line has not met with acceptance. See SLAVIC LANGUAGES.

The territory of the Shtokavian proper is subdivided, principally by the river Ibar, into a western and an eastern (Kosovo-Resavian) group of dialects. A customary, but inaccurate, subdivision is made on the basis of the treatment of the primitive Slavic word *ê.* According as it appears as *e, je,* and *i* three forms of speech (Ekavian, Jekavian or Yekavian, and Ikavian) are distinguished. The Ekavian territory includes the East Shtokavian and that portion of the West Shtokavian which is situated north of the Danube and east of a line drawn from Essegg on the Drave to Kraljevo on the Ibar. The *e* speakers belong almost all to the Greek church, the most notable exception being the Catholics of Syrmia, and use the Cyrillic alphabet with Ekavian spelling. South of the Save and between the Ekavian territory on one side and the rivers Narenta (Neredva) and Bosna on the other, *je* is pronounced instead of *e.* In the remaining western portion of the Shtokavian area the Mohammedans and Roman Catholics as a rule change *ê* to *i* (Ikavian speech), while the Greek orthodox mostly pronounce it as *je* (in the Jekavian way). The Ikavian is no longer written (see SERVIAN LITERATURE), nor are the Tchakavian and Kaikavian dialects.* The Roman Catholics of the western half of the Serbo-Croatian territory, the Mohammedans, and the Greek Orthodox Serbs all use in writing the same language, West Shtokavian, but whereas the western Serbo-Croatians prefer the Roman alphabet (see *Gaj*) and use Jekavian spelling, their eastern brethren use the Cyrilic and Ekavian orthography. The Glagolitsa (q.v.) is met with only in the church books of a few Catholic communities in Dalmatia. Serbo-Croatian spelling is phonetic. In the Roman alphabet as used by the Serbo-Croatians *c* has the value of *ts; j* = *y,* and after a consonant it indicates palatal pronunciation; *z* = Eng. *z* in *azure; š* = *sh; č* = *tch; ć* = palatal *tch.*

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* Properly speaking, the term Croatian should be restricted to the Tchakavian dialect, which has now been reduced to a *patois.* Some writers, however, use the term to include both the Tchakavian and Kaikavian, while others would designate as Croatian Jekavian books written with Roman characters. The term Croatian without further qualification is also ambiguous from the historical and geographical point of view, inasmuch as the boundaries of the Croatian province have undergone extensive change in the course of centuries.

and his *Servian Dialect Map* (Russ., St. Petersburg, 1905). Further, for the ethnological side, L. Niederle, *Le race slave* (trans. Léger, Paris, 1911). Ethnographic maps of Macedonia are also found in the *Report of the International Commission to Inquire into the Cause and Conduct of the Balkan Wars* (Washington, D. C., 1914).

SERBO-CROATIAN LITERATURE. See SERVIAN LITERATURE.

SERBS AND SERVIANS. The Serbo-Croatian words (see SERBO-CROATIAN LANGUAGE) for the Servian country and its people are *Srbija* and *Srbi* (pl.; sing., *Srbin*). The adjective Servian is *srbski* (pronounced and often written *srpski*). Thus, the Serbo-Croatian is seen to have *b* or *p* where the English has *v*. The *b* also appears in the name of the Lusatian Sorbs or Sorabs (see SLAVIC LANGUAGES), and in the European equivalents—serbe, serbo, serbisch, etc.—of Servian. The spelling with *v* is objected to by the Serb people on the ground that it gives sanction to the false etymology which connects Servian with *servus*, a slave or serf (cf. Slav and slave). For this reason in diplomatic correspondence the words Serbia and Serbian are now employed, a usage which is daily growing in currency. Those who use Servia for the Kingdom and Servians for its people frequently employ the noun and adjective Serb to designate not only the population of the Servian state but all the people of the same race, including those who live in Montenegro and Austria-Hungary. Serb is thus synonymous with Serbo-Croatian.

SERCQ. See SARK.

SERENA, sā-rā′nȧ, LA. A town of Chile. See LA SERENA.

SERENADE, sĕr′ē-nād′ (OF. *serenade*, Fr. *sérénade*, from It. *serenata*, serenade, from Lat. *serenus*, serene). Originally music performed on a calm night; hence a song given under the window of a lady by her lover. The modern serenade (or serenata) is a cyclical composition for full orchestra. It differs from the symphony in the greater number of its movements (5, 6, 7, or more) and in their freer construction.

SERE′NUS. A Messianic reformer of the eighth century. See MESSIAH.

SERES, sĕr′ēs. A town of Greece, capital of a department of the same name, 43 miles northeast of Saloniki (Map: Balkan Peninsula, D 4). It is protected by high walls and contains a citadel, many handsome villas, and several mosques and churches. It is the centre of the Macedonian woolen industry and exports skins, cotton, wool, and tobacco. For centuries in the possession of the Ottoman Turks, it was captured by the Greeks in the course of the Balkan War (q.v.) and confirmed to them by the Treaty of Bucharest (August, 1913). Pop., 1913, 18,670.

SERETH, sĕr′ĕt. An important affluent of the Danube. It rises as the Great Sereth in the Austrian Crownland of Bukowina, flows southward in a deeply trenched valley across Moldavia, and joins the Danube 5 miles above Galatz (Map: Balkan Peninsula, F 1). Its principal tributaries are the Little Sereth on the right, and the Suczava, Moldava, and Bistritz on the left. Total length, 291 miles.

SERF (OF., Fr. *serf*, from Lat. *servus*, servant, slave; connected with Av. *har*, to protect). In common usage, an unfree feudal dependent, who occupies a place in the social scale above the slave. The serf was usually a peasant bound to the land which he cultivated and for which he owed service and obedience to the lord in whom the ownership of the land was vested. The serf was frequently the product of the feudal system, and under a feudal organization of society the institution of serfdom, or villeinage, is seen in its most developed form. This article will treat chiefly of serfdom or villeinage as it existed in western Europe.

The origin and development of villeinage in western Europe has been a subject of violent dispute among historians. With the decay of the Roman power in the fourth and fifth centuries anarchy became prevalent and there were many who were compelled to seek the protection of their more powerful neighbors. In return they performed such services as a freeman may perform. This institution was known as the *patrocinium*, and at first the relation terminated with the death of either party. Some of those who sought protection were also owners of small parcels of land, and such land was frequently handed over to the more powerful to be received back by the former proprietor as a *precarium*, i.e., the latter had the usufruct, his protector the ownership. Among the early Germans also there probably existed some such relation between men. In the middle of the nineteenth century it was generally held that the organization of society described in the *Germania* of Tacitus was that of the free village community, by which is meant that the villages were inhabited by freemen, who held land in common and who annually distributed the land anew. Various writers, especially Fustel de Coulanges and Seebohm, have attacked this theory and hold that the manorial system was prevalent in Germany (see MANOR), by which is implied that the peasants held their land from a lord and in return for the use of the property owed service of some kind or other to the owner. In the Frankish kingdom the German and Roman elements met. Again historians are unable to agree whether the chief elements in the feudalism which developed among the Franks were German or Roman or even Celtic. It suffices, however, to state that by the tenth century there were few free peasants or artisans left in what is now France. Probably the institutions of *patrocinium* and *precarium* had been joined together, and after some further development we have serfdom as it existed in France with comparatively slight changes until abolished by the Revolution of 1789. (See FEUDALISM.) In regard to his general condition the French serf may be taken as typical.

The relationship which in France bound the serf to the lord had at first been merely a contract between the two persons in question. The general tendency, however, was towards the establishment of the principle of inheritance, and by the end of the eleventh century son inherited from father in nearly all cases. Still the laws and customs which regulated the relationship between the serf and his lord varied greatly at different periods and in the different provinces of France, as well as in the rest of Europe. Moreover, the dividing line between the serf and the slave on the one hand and the serf and the freeman on the other is not always very clear. In general, a serf was distinguished from the slave in that he had a definite piece

of land for his own use and was protected to some extent even against his lord by fixed customs. He was distinguished from the free peasant proprietor in that he could not leave his lord without the latter's consent and was subject to some exactions from which the freeman was exempt. The chief burdens of the serf were: (1) the *census*, or rent, which, "though estimated in money, was usually paid in the form of a large percentage of the crop, what remained over being nominally the property of the serf"; (2) the *capitagium*, or *census capitis*, which was an annual poll tax; (3) the *taille*, or arbitrary tax, which permitted the owner to demand money of the serf whenever he chose. Besides these three taxes the serf had to work on the lord's domain several days in each week. This was the *corvée*. Also, since the lord's consent was necessary for the serf to marry, permission had usually to be purchased by a fee, known as the *formariage*. Finally, when the serf died, his heir had to pay a fixed sum known as the *mortmain*, since according to the legal theory the property really belonged to the lord and not to the serf and the latter's heir paid to retain the land.

The question arises, How could the serf become free? In answering this question, it must be noted that at first the serf had little desire to become a freeman. His condition was not much improved thereby, for, in the absence of any central authority to which the weak could successfully appeal, the strong could exact from him what they pleased; while, on the other hand, the lord had sufficient interest in his serf to protect him from others. Later, however, at least from the time of Philip Augustus (1180–1223), conditions improved and the weak no longer needed the protection of the nobles in all cases. The lord could bring back his runaway serf, though in some places the theory prevailed that the serf might surrender all his property, both real and movable, to his lord, renounce his bond, and depart. Also some town charters had a clause which declared that an unfree person who came to the town and remained there unclaimed for a year and a day was free. These two methods of emancipation did not meet the demands of improving times, and more regular means developed by which the serf might obtain manumission. The most common came, in time, to be the payment of a fixed sum to the lord, and when the noble was in pressing need of money, as during the Crusades, he sometimes compelled his serfs to buy their freedom.

In general it is believed that the Roman and Celtic civilizations played no rôle in the development of England; that the Anglo-Saxon brought with him his institutions from Germany, such as the free village community or mark. In time, however, "with the growth of population, of inequalities, of social competition, the relations of dependency are seen constantly gaining on the field of freedom," the ceorl becomes a serf, manors arise, and by the time of the Norman Conquest the transformation has been completed. In 1883 Seebohm in his *English Village Community* declared that there never was a mark system in England and that "the Saxon invasion did not destroy what it found in the island. Roman villas and their laborers passed from one lord to the other—that is all. The ceorls of Saxon times are the direct descendants of Roman slaves and coloni, some of them personally free, but all in agrarian subjection. Indeed, social development is a movement from serfdom to freedom, and the village community of its early stages is connected not with freedom but with serfdom." Since the appearance of Seebohm's book numerous works have appeared on both sides and the question is far from settled. The condition of the English serf did not differ essentially from the condition of the French serf. But the English bondsman received valuable privileges much earlier than the French villein. As early as the reign of Edward IV the serf had the right to plead in the royal courts, a privilege which the French serf never obtained. Moreover, in England the last known act of enfranchisement took place in the reign of Elizabeth.

In Germany serfdom was generally not of a very harsh kind, though it varied considerably in different parts of the country. In some portions of Prussia, however, peasants were, until 1773, in a state of absolute slavery. Serfdom was abolished in Prussia by the decree of Oct. 9, 1807, which was issued through the influence of Stein and his associates. This declared that from Martinmas, 1810, all persons should be free in the states of Prussia. Subsequent enactments removed the social and property distinctions which had separated the classes and gave to every citizen the power to possess in fee simple all kinds of property. This legislation was generally imitated in the other German states. The remains of the German system of serfdom lingered until 1836 in Saxony and until 1848 in Austria.

In Russia, where the feudal system never prevailed and the early condition of the peasant was not a servile one, the reduction of the peasantry to a state of serfdom and their attachment to the soil were gradually effected and did not prevail to a very great extent till the close of the sixteenth century. Peter the Great strengthened the attachment of the serf to the soil for fiscal reasons, and under Catharine II the system reached its highest development, the serf being reduced to so low a level that he differed little, if at all, from the slave. Serfs were regarded by law as a part of the proprietor's working capital and as such were bought and sold, sometimes with the land and sometimes without it. The serf had no legal means of self-defense. Alexander I introduced various improvements in the condition of the peasantry, particularly those belonging to the crown, and in his reign serfdom was abolished in Courland and Livonia in order to weaken the power of the German nobles of those districts. The entire abolition of villeinage was effected by Alexander II (q.v.) by a very sweeping measure. The manifesto of March 3 (Feb. 19), 1861, gave personal freedom to more than 20,000,000 serfs.

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SERGEANT, sär'jent (OF. *sergeant*, Fr. *sergent*, Prov. *servent, sirvent*, servant, from Lat. *serviens*, pres. p. of *servire*, to serve; connected with *servus*, slave). An important noncommissioned rank in the army, the next rank above that of corporal. Modern conditions demand more intelligence and military training than ever before and have consequently greatly increased the duties of the grade. In extended movements the sergeant is frequently compelled to act on his own initiative. In both the United States and the British armies sergeants are distinguished by three chevrons; in the former with dress uniforms they are of the color appropriate to the arm of the service and are worn on both sleeves of the coat. With service uniforms the chevrons are of the same color as the main material. British sergeants with dress uniforms have three gold stripes or chevrons on the left arm only and wear a silk sash, similar to that worn by the commissioned officer, except that it is worn over the right shoulder. See CHEVRONS; NONCOMMISSIONED OFFICER; INSIGNIA; RANK.

SERGEANT AT ARMS. In the English Court of Chancery, an officer who attends upon the Lord Chancellor with a mace and executes various writs of process directed to him, apprehending, e.g., persons pronounced in contempt of the court. A similar officer is attached to each House of Parliament and arrests those whom the House orders to be arrested. Sergeants at arms are also attached to the United States Senate and House of Representatives. They receive a salary of $4500 a year. They are authorized to preserve order in both Houses and also have charge of the payment of members.

SERGEANT AT LAW. See SERJEANT AT LAW.

SERGEANT FISH (so called from its lateral stripes, which resemble a sergeant's chevrons). A large, strong, voracious fish (*Rachycentron canadus*), of the southeastern coast of the United States, related to the mackerels, but superficially resembling a remora. Its habit of lingering about large fishes has led to its being named shark's waiting boy, and it is also called cobia and crab-eater. It reaches a length of 5 feet and is olive brown with obscurely striped sides.

SERGEANTY, sär'jen-tĭ, GRAND (OF. *sergentie, serjantie*, from *sergeant*, sergeant, servant). A species of tenure by which many of the nobility of England held their lands of the King under the feudal system. After the Conquest the land was in large part parceled out among the followers of the Conqueror according to their rank. At that time two species of tenure were introduced: tenure by knight service, consisting of an obligation to perform military service in time of war; and tenure by sergeanty, grand and petty, which involved in addition to military service some further service to the King in time of peace. A tenant by grand sergeanty was bound to render some personal service to the King, as to be his standard bearer, cupbearer, or chamberlain, and to attend court during certain seasons. Such tenure was also said to be *per baroniam;* the tenants became known as barons and were higher in rank than the others. Although originally lands so held could not be divided or alienated, this was quietly done from time to time and the burdens of the tenure gradually became extinct and were finally abolished with the military tenures. However, the hereditary privileges and honors, as to be standard bearer, etc., are still claimed by the great nobility on great occasions, as coronations. Petty sergeanty was an inferior service, as to render an arrow or a pair of spurs, etc., to the King annually, and was therefore more in the nature of a socage tenure. See TENURE.

SERGEL, sĕr'gĕl, JOHAN TOBIAS (1740–1814). The principal Swedish sculptor of the Classical school. He was born at Stockholm, where he was first instructed by a French baroque sculptor, L'Archevêcque. He then studied in Paris and after 1767 in Rome, where during a sojourn of 12 years he acquired great reputation. Upon his return to Stockholm he was appointed court sculptor, professor, and in 1810 director of the Academy. His works in the National Museum at Stockholm include a "Faun"; "Cupid and Psyche"; the models of his masterpiece, "Diomedes Stealing the Palladium," and of "The Muse of History Recording the Deeds of Gustavus Adolphus," a group of heroic size; and a colossal "Bust of Gustavus III." Besides these the "Monument of Gustavus III" (1808), at the foot of the Slottsbacke (Palace Hill), the "Resurrection," a large relief in the church of St. Clarons, and the "Monument to Descartes," in the Adolf-Fredriks Kyrka, should be mentioned. Sergel is the greatest Swedish Classicist and has been compared to Thorvaldsen. He strove to escape from the mannerisms of the French baroque and attain the nobility of style and beauty of form of the antique. For his biography, consult Nyblom (Upsala, 1877) and Göthe (Stockholm, 1899).

SERGI, sĕr'jĕ, GIUSEPPE (1841–). An Italian anthropologist, born in Messina, Sicily. He was educated at the University of Messina, where afterward he became an instructor. Later he taught in Milan. In 1880 he was appointed to the chair of anthropology in the University of Bologna; in 1884 he accepted a similar professorship in the Royal University of Rome and at the same time became director of the Anthropological Institute. He has devoted particular attention to the psychic traits as well as to the physical characters of the peoples of the East-Mediterranean region. His publications treat of archæology, criminal anthropology, and education. His best-known works are *Elementi di psicologia* (1879), *Psychologie physiologique* (1887), *Principi di psicologia* (1894), *Specie e varietà umane* (1900), and *The Mediterranean*

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SERGIEV, sĕr'gyĕf, Ivan Ilytch, better known as John of Kronstadt (?–1909). A Russian priest, born at Archangel. In 1855 he received his degree in divinity at St. Petersburg (now Petrograd). His eloquence and zeal as a preacher early gained him a wide reputation, and his hold on the common people was greatly strengthened by the many marvelous cures that he was reported to have wrought. Sergiev was instrumental in founding many charitable institutions. He was present at the death of Czar Alexander III and received various honors from Nicholas II. Several spurious sects calling themselves Johannites came into existence.

SERGINSK, sĕr-gēnsk', Upper and Lower. Two industrial settlements in the Government of Perm, East Russia, 43 miles west-southwest of Ekaterinburg. They were founded by Demidoff (q.v.) in 1742 and still belong to a private company. Most of the inhabitants are engaged in the extensive ironworks and the iron mines in the vicinity. The population of Upper Serginsk was 16,569 in 1910 and of Lower Serginsk about 14,000 in 1911. The annual production of both towns amounts to over 15,000 tons of pig iron and more than 27,000 tons of steel.

SERGIPE, sĕr-zhē'pe. A maritime state of Brazil (Map: Brazil, K 6). Area, 15,090 square miles. It is the smallest state of the Republic. The coast region is flat and sandy; the interior is a sparsely watered plateau. The climate is hot and dry along the coast and river valleys and drier on the uplands. The southwestern part affords good grazing land. The principal products, sugar cane, cotton, and rice, are cultivated in the eastern section of the state. The chief exports are sugar, cotton, rice, salt, and hides. Aracaju (q.v.), the capital, is the most important commercial and industrial centre. Pop., 1900, 356,264; 1912 (est.), 450,000.

SERGIUS, sĕr'jĭ-ŭs. The name of four popes.—Sergius I, Saint. Pope, 687–701. He was born at Palermo of a Syrian family and was ordained priest in 683. On the death of Pope Conon there was a contested election and both factions finally united on Sergius. He refused to confirm the acts of the Trullan Council (see Quinisext), and the Emperor Justinian II sent officers to Rome to seize him; but the soldiery of the exarchate rallied to his defense, and the Imperial emissary's life was saved only by the Pope's intervention. He consecrated St. Willibrord, the Apostle of Frisia, and succeeded in terminating the schism in northern Italy which grew out of the pretensions of the Patriarch of Aquileia. Consult H. K. Mann, *Lives of the Popes*, vol. i (London, 1902).—Sergius II. Pope, 844–847. He was of a Roman family and became archipresbyter under Gregory IV, whom he succeeded. Lothair I, displeased that he had been consecrated, after a contested election, without waiting for Imperial sanction, sent his son Louis with an army to Rome. The Pope and the Roman nobles refused to swear fidelity to Lothair as King of Italy, but recognized him as Emperor, and Louis was solemnly crowned as King of the Lombards. In 846 Rome was attacked and devastated by Saracen hordes, who were finally driven off by Duke Guido of Spoleto, summoned by the Pope. Consult H. K. Mann, *Lives of the Popes*, vol. ii (London, 1906).—Sergius III. Pope, 904–911. He was a Roman by birth, consecrated Bishop of Cære against his will by Formosus in 892 or 893, and elected Pope, on the death of Theodore II in 897, by the Tuscan faction, but not recognized by the Emperor Lambert, who set up John IX. He returned to Rome in 904, overthrew the Antipope Christopher, and gained possession of the see. His pontificate was troubled, and his own character is said by some ancient writers to have been stained by the prevailing immorality. Consult H. K. Mann, *Lives of the Popes*, vol. iv (London, 1910).—Sergius IV. Pope, 1009–12. He was made Bishop of Albano in 1004. On his election to the papacy he changed his own name of Peter, being unwilling out of reverence to call himself Peter II. His power was limited in secular matters by the domination in Rome of the patrician John Crescentius and his family. Consult H. K. Mann, *Lives of the Popes*, vol. v (London, 1910).

SERI, sā'rē. A wild and warlike tribe formerly holding a considerable territory on the west coast of Sonora, Mexico, together with the adjacent island of Tiburon, in the Gulf of California, but now restricted to the island. Consult McGee, *The Seri Indians* (Washington, 1899).

SERICITE, sĕr'ĭ-sīt (from Lat. *sericum*, silk, from Gk. *σηρικός, sērikos*, silky, seric, from *Σῆρ, Sēr*, Chinaman). A fine scaly variety of muscovite, characterized by a silky lustre. It is found chiefly near Wiesbaden, Germany. See Muscovite.

SERICITE GNEISS, or Sericite Schist. A metamorphic rock, composed essentially of the hydromicaceous mineral sericite (q.v.) with quartz, or quartz and feldspar. In some cases at least sericite gneiss has been produced by the mashing of granite and rhyolite (q.v.) under the action of mountain-building forces.

SERICULTURE, sĕr'ĭ-kŭl'tûr. See Silkworm; Silk.

SERIEMA, sĕr'ĭ-ē'mȧ. A bird. See Çariama, and Plate of Cranes.

SERIES (Lat. *series*, row, succession, from *serere*, to bind; connected with Gk. *εἴρειν, eirein*, Skt, *sā, to* bind). In mathematics, a succession of terms formed according to some common law; e.g., (1) in the series 1, 3, 5, 7, ... each term is formed from the preceding by adding 2; (2) in 3, 9, 27, 81, ... each term is formed by multiplying by 3. A series in which each term after the first is formed by adding a constant to the preceding term is called an *arithmetic* series or progression, e.g., series (1) above. A series in which each term after the first is found by multiplying the preceding term by a constant is called a *geometric* series or progression, e.g., series (2) above. In arithmetic and elementary algebra a finite series is usually called a *progression*. Any term t_n of an arithmetic series is given by the formula $t_n = a + (n-1)d$, in which a is the first term, d the common difference, and n the number of terms. The sum of n terms is given by the formula $s = \frac{n}{2}(a+l)$, l being the last term. In geometric series the corresponding formulas are $t_n = ar^{n-1}$, $s = \frac{rl-a}{r-1}$, or $\frac{ar^n-a}{r-1}$. A series the reciprocals of whose terms form an arithmetic series is called a *harmonic* series or progression.

Hence any term may be found by applying the formulas of arithmetic series to the reciprocals of its terms.

Although the above are the chief series treated in elementary algebra, there is an unlimited number of kinds. For example, a type to which considerable interest is attached is the arithmetico-geometric series, in which the coefficients are in arithmetic series and the variable in geometric series, e.g., $1 + 2x + 3x^2 + \ldots . (n-1)x^{n-2} + nx^{n-1}$. If the number of terms in a series is unlimited, it is called an *infinite* series. The general or nth term in such a series and the sum of n terms, n being indefinitely great, may or may not be determinate. Infinite series in which the values of t_n and s_n $(n = \infty)$ are indeterminate are of little value, but those in which a limit for s_n can be found are important. Thus, in an infinite geometric series whose ratio is less than 1, $s = \frac{a}{1-r}$, i.e., $\frac{a}{1-r}$ is the *limit* to which the sum approaches as the number of terms increases indefinitely. For example, to find the sum of the distances traveled by an elastic ball which falls 2 feet and bounds 1 foot and continues indefinitely to rebound one-half the distance fallen. The case is purely hypothetical, for no ball is elastic enough to rebound in this way. If, however, the case were possible, the distance traveled in the first vibration would be 3 feet, in the second 1½ feet, in the third ¾ foot, and so on indefinitely, whence for the whole distance $s_n = \frac{3}{1-\frac{1}{2}}$ or 6 feet. Recurring decimals may also be regarded as forming an infinite series and expressed as a fraction by means of the formula $s_n = \frac{a}{1-r}$. For example, $0.666\ldots. = \frac{6}{10} + \frac{6}{100} + \ldots.$, where $a = \frac{6}{10}$ and $r = \frac{1}{10}$. Therefore $s_n = \frac{\frac{6}{10}}{1-\frac{1}{10}} = \frac{2}{3}$.

An infinite series in which s^n, as n increases indefinitely, has a finite limit is called a *convergent* series, otherwise it is in general a *divergent* series. A series in which the sum is finite, but takes alternate values as n increases, as in $1 - 1 + 1 - 1 + \ldots .$, is called an *oscillating* series.

The ability to determine what particular series are convergent and to determine the limit of s_n evidently conditions the utility of any series for the purpose of pure and applied mathematics. Thus, the trigonometric functions $\sin x = x - \frac{x^3}{3!} - \frac{x^5}{5!}\ldots.$, $\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!}\ldots.$, the exponential series $e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!}\ldots.$, and the logarithmic series $\log(1+x) = \frac{x}{1} - \frac{x^2}{2} + \frac{x^3}{3}\ldots.$ are available only for those values of the variables which render the series convergent.

A knowledge of elementary series is very old, the Ahmes papyrus (c.1700 B.C.) having referred to both arithmetic and geometric progressions, and the Pythagoreans (550 B.C.) having treated the subject quite comprehensively. (See NUMBER.) Euclid (c.300 B.C.) used geometric series, and infinite convergent series of the geometric type appear frequently in the works of Archimedes (c.250 B.C.). Among the Hindus Aryabhatta, Brahmagupta, Mahavir, and Bhaskara treated arithmetic series, and Bhaskara discussed geometric series. The Arabs did little to advance the subject, and the Europeans up to the sixteenth century had made no further progress. Saint-Vincent (1584–1667) and Mercator (c.1620–87) developed the series for $\log(1+x)$, and Gregory (1668) those for $\tan^{-1}x$, $\sin x$, $\cos x$, $\sec x$, $\csc x$. The terms "convergent" and "divergent" appear in the writings of Gregory.

The real theory of infinite series may be said to begin with Newton and Leibnitz and to have been further advanced by Euler. In 1812 Gauss published his celebrated memoir on the hypergeometric series (name due to Pfaff), which has since occupied the attention of Jacobi, Kummer, Schwarz, Cayley, Goursat, and numerous others. Cauchy (1821) may be considered the founder of the theory of convergence and divergence of series. He advanced the theory of power series by his expansion of a complex function in such a form. Abel was the next important contributor, and he corrected certain of Cauchy's conclusions. General criteria began with Kummer (1835) and have been studied by Eisenstein (1847), Weierstrass in his various contributions to the theory of functions, Dini (1867), Du Bois-Reymond (1873), and many others. Pringsheim's (from 1889) memoirs present the most complete general theory.

The theory of uniform convergence was treated by Cauchy (1821), his limitations being pointed out by Abel, but the first to attack it successfully were Stokes and Seidel (1847–48). Semi-convergent series were studied by Poisson (1823) and Jacobi (1834). Fourier's series were investigated as the result of physical considerations, and Fourier (1807) set for himself the problem to expand a given function of x in terms of the sines or cosines of multiples of x, a problem which he embodied in his *Théorie analytique de la chaleur* (1822). He did not, however, settle the question of convergence of his series, a matter left for Cauchy (1826) to attempt and for Dirichlet (1829) to handle in a thoroughly scientific manner. Among other prominent contributors to the theory of trigonometric and Fourier series have been Riemann, Heine, Lipschitz, Schläfli, Du Bois-Reymond, Dini, Hermite, Helphen, Krause, Byerly, and Appell.

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SÉRIGNY, sâ'rē'nyē', Sieur de. See Le Moyne, Joseph.

SERINAGUR, se-rē'nŭ-gŭr'. The capital of Kashmir. See Srinagar.

SERINGAPATAM, se-rĭn'gà-pà-tăm', or **SRIRANGAPATAM.** A town in the native State of Mysore, India, 9 miles northeast of the city of Mysore, on an island in the Kavery River (Map: India, C 7). It is poorly built and unhealthful. A portion of the palace of Tippu Sahib, within the inclosure of the old fort, still remains. Other objects of interest include the Darya Daulat Bagh, the handsome summer residence of Tippu; the Lal Bagh (garden) with the tombs of Tippu and his father, Hyder Ali; and the ancient temple of Vishnu Shri Ranga, from which the town derives its name. Seringapatam was the capital of Mysore until 1799. On May 4 of that year the town was stormed by the British, Tippu Sahib being killed. Pop., about 12,000.

SERING'HAM. A town of Madras, India. See Srirangam.

SERJEANT (sär'jent) **AT LAW.** The highest rank of barrister (q.v.). It is a title of great antiquity, but nearly extinct in England, although still common in Ireland. The nature of the office can be clearly understood only by a study of legal education in the Inns of Court and chancery, briefly described in the preface to the third part of Sir Edward Coke's Reports as follows: "Now, for the degrees of the law, as there bee in the Universities of Cambridge and Oxforde divers degrees, as Generall Sophisters, Bachellors, Masters, Doctors, of whom bee chosen men for eminent and judiciall places, both in the church and Ecclesiasticall Courts; so in the Profession of the Lawe, there are Mootemen, (which are those that argue readers' cases in houses of Chauncerie, both in Termes and graund vacations.) Of mootemen, after eight years' study or thereabouts, are chosen utter-barristers; of these are chosen readers in innes of Chauncerie: of utter-barristers, after they have beene of that degree twelve yeares at the least, are chosen benchers, or auncients, of which one that is of the puisne sort reades yearely in Summer vacation, and is called a single reader; and one of the auncients that have formerly read, reades in Lent vacation, and is called a double reader, and commonly it is between his first and second reading about nine or tenne years. And out of these the king makes choyse of his attorney or sollicitor-generall, his attorney of the court of wardes and liveries, and attorney of the duchy: and of these readers are serjeants elected by the king, and are by the King's writ called *ad statum et gradum servientis ad legem:* and out of these the king electeth one, two, or three, as pleaseth him, to be his serjeants, which are called the king's serjeants; of serjeants are by the king also constituted the honorable and revered judges and sages of the law." A serjeant was appointed by a writ under the great seal, upon the nomination of the Chief Justice of the Common Pleas, in whose court he was entitled for centuries to exclusive audience. Socially serjeants took precedence of king's counsel, while professionally the latter outranked the former, unless serjeants held special patents of precedence. The decay of this order in England is due in part to the fact that the Judicature Act of 1873 renders it unnecessary that a person should be admitted to the rank of serjeant before appointment to a Supreme Court judgeship, and in part to the abolition of the exclusive right of audience in the Common Pleas. Consult Manning, *Antient Privileges of the Serjeants at Law* (London, 1840), and Pulling, *The Order of the Coif* (ib., 1884).

SERLIO, sâr'lyō, Sebastiano (1475–1554). An Italian architect and writer on art, born at Bologna. He worked as an architect at Pesaro from about 1510 until 1514, then, after having frequented in Rome the school of Peruzzi, he was employed at Bologna and Venice, and in 1540 went to Paris, where he became royal architect in 1541 and was engaged in the work on the Louvre and the Tuileries and at Fontainebleau. He is remembered chiefly for his treatise on architecture, in which he embodied all the precepts of Vitruvius and which was published in seven books (Lyons, 1537–51, 1575). Consult Léon Charvet, "Sebastiano Serlio," in *Biographies d'architectes* (Lyons, 1869).

SERMONETA, sĕr'mō-nā'tà, Duke of. See Caetani, M. A.

SER'MONISM. See Nominalism.

SERNA Y DE HINOJOSA, José de la. See La Serna y de Hinojosa, José de.

SEROTINE, sĕr'ō-tĭn (from Lat. *serotinus,* late, from *serus,* late). A large dark-brown bat (*Vesperugo serotinus*), of particular interest for its very wide distribution, since it is known all over Europe south of the Baltic, in Africa north of the equator, throughout the southern half of Asia, and in most of North America. It seems to be identical with the dusky or Carolina bat. Several color varieties are locally distinguished. See Bat.

SE'ROUS FLUID (from Lat. *serum,* whey, serum; connected with Gk. *ὀρός, oros,* whey, Skt. *sar,* to flow). A thin watery fluid occurring in various parts of the animal body, distinguished from mucus principally by its limpidity and by its being found in closed cavities only. It contains a little protein, a trace of fibrin, about 6 per cent of solid constituents, and 94 per cent of water. Serous fluids have been arranged under three heads: (1) those which are contained in the serous sacs of the body, as the cerebrospinal fluid, the pericardial fluid, the peritoneal fluid, the pleural fluid, the fluid of the tunica vaginalis testis, and the synovial fluid; (2) the fluids existing in the eyeball, the amniotic fluid, and transudations into the tissue of organs; (3) morbid or excessive transudations, such as dropsical fluids, the fluids occurring in hydatids, and in blebs and vesicles on the skin, and transudations from the blood in the intestinal capillaries, as in cases of intestinal catarrh, cholera, or dysentery.

All these fluids bear a close resemblance to one another, both in their physical and chemical characters. In so far as relates to their physical characters they are usually clear and transparent, colorless or slightly yellow, of a slight saline, mawkish taste, and exhibiting an alkaline reaction with test paper. They possess no special formed or histological elements, but on a microscopic examination blood corpuscles, cells of various kinds, and epithelium may occasionally be observed in them. They also contain fats, animal soaps, cholesterol, extractive matters, urea (occasionally), the same inorganic salts which are found in the serum of the blood, and the same gases as occur in the blood. As rare constituents, and occurring only in disease, may be mentioned glucose, the biliary

acids, and pigments, salts of lactic and succinic acids, creatinin, mucin, etc.

SEROUS MEMBRANE. There are seven serous membranes in the human body, three being median and single, while two are double and lateral. They are the arachnoid, the pericardium, and the peritoneum, with the two pleuræ and tunicæ vaginales testis. Thus they are connected, with the obvious view of facilitating motion and affording general protection, with all the most important organs in the body. Each sac or continuous membrane consists of two portions—a parietal one, which lines the walls of the cavity, and a visceral, or reflected one, which forms a coating or investment for the viscera contained in the cavity. During health the opposing surfaces of these serous membranes are in contact and only enough fluid is secreted to render them moist and capable of easy movements. Of their structure it is sufficient to state that they consist essentially of (1) epithelium; (2) basement membrane; (3) a stratum of areolar or cellular tissue, which constitutes the chief thickness of the membrane and is the constituent on which its physical properties are mainly dependent. See PERITONEUM; PERICARDIUM; PLEURA.

SEROV, syâ'rôf, ALEXANDER NIKOLAIEVITCH (1820–71). A Russian composer and writer on music, born at St. Petersburg (Petrograd). He studied piano and cello with Carl Schuberth, but was entirely self-taught in composition. In 1850 he began his propaganda for the new German school, especially the works of Wagner. Not until his fortieth year did he turn to original composition. His first opera, *Judith* (1863), scored an emphatic success, which was even surpassed by his second opera, *Rogneda* (1865). A third opera, *The Power of Evil* (1871, posthumous), was completed by his widow, Valentine Bergmann, herself the composer of a successful opera, *Uriel Acosta* (1885). Besides these works for the stage he wrote some smaller pieces for orchestra, a Stabat Mater, an Ave Maria, and a suite arranged by his widow from sketches for an unfinished opera. His instrumentation is always brilliant and effective, but the music itself exhibits a curious blending of the styles of Meyerbeer and Wagner.

SER'OW (East Indian name). One of a group of goat antelopes (genus *Nemorhœdus*), nearly allied to the gorals (q.v.), but more shaggy. They inhabit southeastern and eastern Asia and make their home upon high and difficult mountains, where they go about in pairs or family parties, much after the manner of the wild sheep. The common serow (*Nemorhœdus bubalinus*) is an inhabitant of the Himalayan Mountains and is a rather large, ungraceful animal, with coarse blackish and reddish hair, and with rough black horns about a foot long, standing upright upon the head, with a backward curve. Another well-known species is the cambing-utan (*Nemorhœdus sumatrensis*), which inhabits hilly districts from eastern Tibet southward to Sumatra. Other smaller species are known in Japan and in Formosa. Consult: W. T. Blanford and other writers upon East Indian zoölogy; Kinloch, *Large Game Shooting in Thibet and Northern India* (London, 1885); Richard Lydekker, *The Game Animals of India, Burma, Malaya, and Tibet* (ib., 1907). See Plate of GOAT ANTELOPES.

SERPA PINTO, sĕr'pà pēn'to, ALEXANDRE ALBERTO DE LA ROCHA (1846–1900). A Portuguese explorer. He entered the Royal Military College in Lisbon and in 1864 became an ensign. He went from Benguela to Durban, across the continent of Africa, in 1877–79. This expedition he described in a work which was published in London (2 vols., 1881) under the title *How I Crossed Africa* and which was also translated into French and German. In 1884–86, accompanied by Cardozo, he led another expedition to Mozambique, where the Portuguese power was extended to Lake Nyassa. In 1889 he went once more to Africa, but was finally recalled in 1890 on account of England's opposition to his strongly Portuguese policy in Matabeleland.

SERPENT. See SNAKE.

SERPENT (OF., Fr. *serpent*, from Lat. *serpens*, creeping, snake, pres. p. of *serpere*, to creep; connected with Gk. ἕρπειν, *herpein*, Skt. *sarp*, to creep). A powerful bass musical wind instrument, consisting of a tube of wood covered with leather, furnished with a mouthpiece like a trombone, ventages, and keys, and twisted into a serpentine form, whence its name. Its compass is from $_1B\flat$ to $b\flat^1$. When skillfully played it exhibits the most startling inequalities of tone, in consequence of there being three notes, d, a, d, much more powerful than the others. The serpent was invented in 1590 by Edme Guillaume, a canon of Auxerre in France.

SER'PENTA'RIA (Lat., snakeweed), or VIRGINIA SNAKEROOT. The rhizome and dried roots of *Aristolochia serpentaria* and *Aristolochia reticulata*. Habitat North America. It contains a volatile oil, a resin (a camphor), and a bitter principle (*aristolochine*). It has a pungent odor and a warm camphoraceous taste. In small doses it acts as a simple bitter, increasing the appetite, assisting digestion, and mildly relaxing the bowels. In large doses it causes nausea, vomiting, and diarrhœa. It has been credited with diaphoretic, diuretic, aphrodisiac, emmenagogue, and many other properties which it probably does not possess. Its principal use is in bronchitis, in which it increases the bronchial secretion. There are three official preparations: the infusion, the fluid extract, and the tincture. See ARISTOLOCHIA.

SERPENT CHARMING. See SNAKE CHARMING.

SERPENT EAGLE. A crested and spotted eagle of the East Indian and African genus *Spilornis*, the species of which include snakes in their food. The largest and best known by this name is the cheela (*Spilornis undulatus*) of India and eastward, which is brown with a black and white head, round white spots on the lower surfaces, and a broadly banded tail. The same name is given to the harrier eagles (*Batastur*) and especially to the secretary bird (q.v.).

SERPENT HEAD. See SNAKE-HEADED FISH.

SERPENTINE, sĕr'pen-tīn (OF., Fr. *serpentin*, from Lat. *serpentinus*, relating to a serpent, from *serpens*, creeping, snake). A hydrated magnesium silicate mineral that crystallizes in the monoclinic system. It has a resinous to greasy and earthy lustre and in color ranges through the different shades of green to brown and sometimes yellow or red. Serpentine is rarely found crystallized, as it most commonly occurs in fibrous or lamellar aggregations. It takes a high polish and is frequently employed as a material for ornaments. Serpentine frequently occurs in sufficient masses to form rocks, and in such cases it is generally associated

with other minerals, viz., fibrous hornblende, talc, calcite, magnesite, chlorite, chromite, and oxides of iron, with residual portions also of augite, olivine, and hornblende crystals. The color of the rock, which is generally some variety of green, and the streaks of brown iron oxide are responsible for the name "serpentine." As a building stone serpentine has great toughness and durability combined with beauty of color and, being soft, is easily cut. It not infrequently contains, however, numerous crystals of a variety of garnet known as pyrope (Bohemian garnet, Cape ruby), which, while adding some beauty to the stone, offer by their extreme hardness a serious obstacle to its working. The fibrous variety of serpentine, asbestos (q.v.), is utilized in the manufacture of fireproof materials. Serpentines are the principal source of chromite, and deposits of nickel and platinum are sometimes associated with these rocks. Serpentine with calcite, magnesite, or dolomite forms a beautiful mottled or veined rock to which the name "ophiolite," or "ophicalcite," or, more commonly, "verd antique," is given. This material is used for ornamental pillars and decorative purposes. See CHRYSOTILE.

SERPENT MOUND. A remarkable earthwork near Peebles, Adams Co., Ohio, 71 miles east of Cincinnati. It is in the form of a huge serpent, 1000 feet long, 5 feet high, and 30 feet wide at the base. The tail ends in a triple coil, and between the open jaws lies an egg-shaped mound 109 by 39 feet. It is supposed to be the work of the mound builders (q.v.). See ARCHÆOLOGY, AMERICAN.

SERPENTS, FASCINATION BY. See FASCINATION BY SERPENTS.

SERPENT WORSHIP. See NATURE WORSHIP; OPHITES.

SER'PULA (Neo-Lat., from *serpere*, to creep). A marine annelid worm which secretes a tubular calcareous shell, more or less coiled and often forming large detached masses of reddish rock. The large, solid limestone tubes of these worms materially assist in building up coral reefs, especially on the coast of Brazil. Serpulæ have been noticed by A. Agassiz to form often on coral reefs incrusting masses of considerable extent. Serpulæ occur at great depths in the Gulf of Mexico, while some were dredged by the *Challenger* expedition at depths of nearly 3000 fathoms.

A GROUP OF SERPULÆ.

The worms (*Serpida vermicularis*) are shown with expanded tentacles, as if under water.

SERRA, JOSÉ FRANCISCO CORREA DA. See CORREA DA SERRA, J. F.

SERRA, sĕr'rȧ, MIGUEL JOSÉ. See JUNÍPERO.

SERRADELLA, sĕr'rȧ-dĕl'lȧ, or **SERRADILLA** (Portug. *serradilla*, dim. of *serrado*, serrate, from Lat. *serratus*, saw-shaped, from *serra*, saw), BIRD'S-FOOT (*Ornithopus sativus*). An annual leguminous plant indigenous to southern Europe and northern Africa, cultivated for forage, hay, and green manuring. It prefers a moist climate and a sandy soil of good tilth. When broadcasted the land is harrowed and sometimes rolled to press the seed into the soil. In drilling the seed is planted about an inch deep. Two cuttings are obtained during the season. If sown about April 1 it can be used for green forage in July and a second cutting may be obtained in September. It is cut for hay at the close of the blossoming period.

The green crop (cut when in bloom) has the following average composition: water, 79.9; protein, 2.9; fat, 0.7; nitrogen-free extract, 10.0; crude fibre, 3.4; ash, 3.1 per cent. The hay contains: water, 9.2; protein, 15.2; fat, 2.6; nitrogen-free extract, 44.2; crude fibre, 21.6; ash, 7.2 per cent. Like other leguminous crops, it has a fairly high protein content. In feeding value it does not differ greatly from red clover. It has the advantage that it may be fed up to nearly the end of the blooming period without deterioration. When the hay is cured care must be taken to prevent loss due to the breaking of fine leaves and stems.

SERRA DO MAR, sĕr'rȧ dô mär. The southern division of the Brazilian Coast Range, running along the southeast coast of the country through the states of Paraná, São Paulo, and Rio de Janeiro. To the south, in Santa Catharina and Rio Grande do Sul, runs the somewhat distinct range known as the Serra Geral, while the northern division of the Coast Range bends west towards the Serra da Mantiqueira, which runs parallel with the Serra do Mar, separated from it by the valley of the Parahyba River. The range is the outermost escarpment of the great Brazilian plateau and forms the divide between the Paraná River and the very short streams running into the Atlantic Ocean. Near Rio de Janeiro, where it reaches its highest elevation (from 6000 to 7000 feet), it is very rugged with numerous sharp granite crags, which from a distance suggest the pipes of an immense organ, whence this portion has been called the Organ Mountains.

SERRAN'IDÆ (Neo-Lat. nom. pl., from Lat. *serra*, saw). The family of sea bass (q.v.), many species of which are called serranos by the fishermen of Spanish America.

SERRANO. See SHOSHONEAN STOCK.

SERRANO Y DOMÍNGUEZ, sĕr-rä'nô ê dô-mĕn'gâth, FRANCISCO, DUKE DE LA TORRE and COUNT OF SAN ANTONIO (1810–85). A Spanish statesman and general, born near Cadiz. He fought against the Carlists from 1833 to 1839 and attained the rank of brigadier general. Elected to the Cortes from Malaga in 1839, he joined with Espartero in bringing about the overthrow of the Queen mother Christina in 1840, but three years later turned against the regency of Espartero and was Minister of War for some time after the beginning of the personal reign of Isabella II. He became lieutenant general in 1847, captain general of the army and military governor of New Castile in 1856, Ambassador at Paris in the following year, and from 1859 to 1862 was captain general of Cuba. His services in Cuba and in the reconquest of Santo Domingo gained him the ducal title, and on his return to Spain in 1862 he was made Minister of Foreign Affairs. A faithful follower of O'Donnell, he aided greatly in the suppression of the revolt of June, 1866, in Madrid and upon O'Donnell's death succeeded him in 1867 as

chief of the Liberal Union. In spite of his intimate relations with Queen Isabella he plotted assiduously against her government. With other leaders of the Opposition he was transported to the Canary Islands in July, 1868, but returned to Cadiz in September after the outbreak of the military revolution, assumed charge of the movement together with Prim, Topete, and Sagasta (qq.v.), and at the head of the revolutionary forces defeated the royal troops at Alcolea (September 28). Isabella fled to France, and Serrano was declared by the Cortes Regent of the Kingdom in June, 1869, having acted in the interval as chief of the provisional government. Under King Amadeus he was at the head of two short-lived ministries (January–July, 1871; June, 1872) and carried on an active campaign against the Carlists (1872). Serrano looked with disfavor upon the establishment of the Republic following the abdication of Amadeus, and upon the overthrow of the government by General Pavia in January, 1874, became chief of the executive, holding office till the accession of Alphonso XII.

SER'RES, Olivia, *née* Wilmot (1772–1834). An English impostor, born at Warwick. In 1791 she was married to J. T. Serres, from whom she separated in 1804. She exhibited at the Royal Academy in 1794 and in 1804–08, and in 1806 was landscape painter to George, Prince of Wales. In 1817 she made claim in a petition to George III to be the natural daughter of Henry Frederick, Duke of Cumberland, the King's brother. After the death of George III she asserted she was the Duke's legitimate daughter and assumed the title of Princess of Cumberland in 1820. In the following year she was arrested for debt. Her royal pretensions, though accepted by many, were not generally considered to have been well founded. She published *St. Julian* (1805), a novel, and *Flights of Fancy: Poems* (1806).

SERRET, se-rā', Joseph Alfred (1819–85). A French mathematician, born in Paris and educated in the Ecole Polytechnique. In 1861 he became professor at the Collège de France. Serret's mathematical textbooks are very valuable. The following list comprises his most important treatises: *Cours d'algèbre supérieure* (4th ed., 1879); *Traité de trigonométrie* (7th ed., 1888); *Eléments de trigonométrie* (1853); *Cours de calcul différential et intégral* (4th ed., 1894). Serret also edited the works of Lagrange (7 vols., 1867–92) and Lacroix's *Calculus* (1881).

SERTO'RIUS, Quintus. A Roman commander, born at Nursia in the Sabine territory. He fought, 105 B.C., in the disastrous battle on the Rhone, in which the Roman proconsul, Quintus Servilius Cæpio, was defeated by the Cimbri (q.v.) and the Teutones, and took part in the splendid victory at Aquæ Sextiæ (now Aix), 102 B.C., where Marius (q.v.) annihilated the Cimbri and the Teutones, and on the breaking out of the sanguinary struggle between the party of the nobles under Sulla (q.v.) and the popular party headed by Marius (q.v.), 88 B.C., he espoused the cause of the latter. He fought in conjunction with Cinna the battle at the Colline Gate (87 B.C.) which placed Rome at the mercy of the Marians, but he had no hand in the bloody massacres that followed. He got his own troops together and slew 4000 of the ruffianly slaves whom Marius was permitting to plunder at will through the city. On the return of Sulla from the East (83 B.C.) Sertorius went to Spain, where he continued the struggle. At the invitation of the Lusitanians he collected an army of natives, Libyans, and Romans, and after a time became the virtual monarch of the whole country. In 76 B.C. Pompeius was sent against Sertorius, but the latter drove him over the Iberus (Erbo). Finally Perperna and other Roman officers of the Marian party who had fled to Sertorius in 77 B.C. assassinated him 72 B.C. Plutarch wrote a *Life* of Sertorius, and Corneille made him the subject of a tragedy.

SE'RUM (Lat., whey, serum). See Blood; Serum Therapy.

SERUM GLOBULIN. See Globulins.

SERUM THERAPY. In the strictest sense of the term serum therapy is the employment, for the cure or prevention of a disease, of the serum of an animal previously rendered immune to the same disease by injecting it with cultures of living or dead bacteria. With the gradual widening of our knowledge of the principles of immunity (the various phases of which are discussed under that title) serum therapy has come to embrace not only the use of immune animal serum, but of normal animal and human serum, convalescent serum, and the injection of pathological exudates as in autoserotherapy. After the introduction of antidiphtheritic serum (antitoxin), with its marvelous curative and prophylactic effects, antitoxic serums were prepared against nearly all of the known bacterial diseases, but none of them have approached antitoxin in value, and most of them proved worthless and even harmful. Several have been superseded by the corresponding vaccines or bacterins (see Vaccine Therapy), which are killed cultures of bacteria held in watery suspension. According to the antitoxin theory of immunity artificial resistance may be acquired through the introduction of attenuated cultures of microorganisms into the animal body, by which means it is rendered immune to virulent forms of these organisms through an antibody developed in the blood. The use of blood serum containing such antibodies or antitoxins constitutes what is called serum therapy.

Preparation. The method of producing an antitoxic serum is typically illustrated in the manufacture of diphtheria antitoxin. A culture of the Klebs-Loeffler bacillus is made and the bacilli later destroyed with a weak antiseptic solution. The organisms are then removed by filtration. A small amount of the filtrate, containing only the toxin generated by the bacilli, is injected into a healthy horse. These injections are repeated at intervals, the dose being gradually increased, until the serum of the animal shows that an antitoxin of sufficient strength has been formed. The serum is tested by injecting it into guinea pigs, previously inoculated with diphtheria bacilli. The strength is expressed in antitoxin units, a unit, according to Ehrlich's standard, being defined as a quantity of serum sufficient to protect a guinea pig weighing 250 grams against 100 times the fatal dose of toxin. When the standard strength is reached the serum is withdrawn from the animal, treated with a small amount of preservative, and measured into definite doses. Antitoxin is marketed in doses varying from 500 to 10,000 or more units, the latter being employed in severe cases of laryngeal diphtheria.

Of the many antitoxic serums, several need only be mentioned, since they have proved therapeutically inefficient. Such are antipneumonia

serum; antityphoid serum of Chantemesse; antistreptococcic serum, first prepared by Marmorek by the immunization of ponies against increasing quantities of living cultures of the streptococcus which were previously passed through rabbits to increase their virulence. Aronson, Moser, and Menzer also prepared antistreptococcic serum with slightly differing technique. The diseases supposedly amenable by these serums are erysipelas, puerperal and general septicæmia, local streptococcus infections, and scarlet fever. Certain types of rheumatism have also been thus treated. Antistaphylococcus and antigonococcus serums have been almost entirely replaced by the corresponding vaccines. Others are antitubercle serum, now superseded by tuberculin; antirabic, antidysenteric, anticholera, and antianthrax serums. Sarcoma antitoxin is a mixture of cultures of *Bacillus prodigiosus* and *streptococcus* prepared by Coley, of New York, and known as Coley's fluid. Several carcinoma antitoxins have been prepared, but have proved disappointing. Of the serums now considered therapeutically active (besides antitoxin) are antitetanic serum, antimeningitic serum of Flexner, Yersin's antiplague serum and the antivenins. Dunbar's serum, also known as pollantin, is obtained from animals immunized against the pollen of various plants and grasses. It is successful in only a limited number of cases of hay fever, owing to the fact that this affection may be excited by so many pollens. Recent researches have demonstrated that these substances are almost innumerable, and a cure is to be expected only after the particular agent is found and its special serum made. Yersin's antipest serum is blood serum taken from horses that have been inoculated with the plague. Haffkine's fluid is a liquid in which the bacillus of plague has been cultivated and rendered virulent by special methods, the bacilli being killed by exposure to heat. (For the therapeutic indications of these substances, see PLAGUE.) Antivenin is the serum of an animal, usually a sheep or goat, which has been treated with minute doses of the venom of some poisonous snake until immunity is acquired. Snake venoms contain three toxic principles, hemorrhagins, neurotoxins, and fibrin ferments. Neurotoxins form the most important element in the venom of poisonous snakes in India and Africa. The venom of the American rattlesnake, copperhead, and moccasin produces its effect chiefly through hemorrhagins. Australian snake venom contains all three of these constituents in fairly equal quantities. Neurotoxin kills principally through paralysis of the respiratory centre. The hemorrhagins produce local destruction and are less fatal than the neurotoxins. A special antivenin has to be prepared against each class of snake. Among the antivenins now obtainable are cobra antivenin (Calmette and Lamb); crotalus antivenin (Flexner, Noguchi, McFarland); moccasin antivenin (Noguchi); and antivenins against lachesis, *Crotalus terrificus*, trimeresurus, and daboia. Normal serum has a distinct bacteriological action, but is chiefly employed to combat hemorrhagic diseases and arrest surgical bleeding. Normal horse serum is particularly valuable in controlling persistent bleeding after injury or operation in certain individuals. Normal human blood serum is injected principally in the bleeding which takes place from the umbilical cord of the newborn infant. It is also useful in pernicious anæmia, but with the simplified technique of transfusion now available the whole blood is preferably given. Convalescent serum is taken from human beings who are convalescing from infectious fevers and injected into other individuals who are suffering from the same disease. The method has been used in measles, scarlet fever, diphtheria, pneumonia, and pellagra, but reports are contradictory as to its value. Autoserotherapy consists in the withdrawal of a small amount of an exudate, as, e.g., in pleurisy with effusion, and reinjecting the same immediately into another portion of the body. Pleurisy and abdominal ascites have been thus treated with reported success. Another method of obtaining serum consists in the artificial production of a blister and withdrawing some of the serum thus collected for reinjection. Certain chronic skin diseases are said to be benefited by this procedure. Leucocyte extract, first prepared by Hiss, is a watery extract of washed leucocytes, obtained from the pleural cavity of rabbits after the introduction of aleuronat, which sets up an artificial pleurisy. It is injected into the loose tissue of the abdominal wall in erysipelas and pneumonia.

Serum Sickness.—The injection of animal serum is sometimes followed by unpleasant and even alarming symptoms, independent of the size of the dose. The principal manifestation is an itching urticaria, but there may be a rise in temperature, swelling of the glands, joint pains, œdema, and albuminuria. These symptoms develop after the first injection, whereas anaphylaxis (q.v.), a much more dangerous complication, occurs only after a second injection. Serum intoxication is observed in about 20 per cent of cases in man, but it subsides in a short time and leaves no aftereffects. See RICHET, CHARLES.

SERVAL, sĕr'val (South African name). A large, long-legged African wild cat (*Felis serval*), which may reach 40 inches in length, with a tail 16 inches long. It is varying tawny in color, with black spots, tending to form two longitudinal bands on the back and rings on the tail. Its fur, known in trade as tiger cat, may be recognized by two characteristic horizontal black bands on the upper inner surface of each foreleg.

SERVANT. See MASTER AND SERVANT.

SERVE'TUS, MICHAEL, or, in his native Spanish, MIGUEL SERVETO (SERVEDE) Y REYES (c.1511–53). A celebrated antitrinitarian theologian and physician, born at Tudela in Navarre. He began his studies at Saragossa and entered the services of Quintana, later confessor of Charles V, with whom he went to Toulouse in 1528, and there began the study of law. In a short time, however, he gave himself entirely to the knotty points of the Reformation doctrines. In 1530 he went to Basel to hear Œcolampadius and thence to Strassburg, where Bucer and Capito taught. His daring denial of the doctrine of the Trinity frightened or angered these divines to such a degree that they denounced him as "a wicked and cursed Spaniard." Servetus appealed from their judgment to that of the public in his *De Trinitatis Erroribus Libri VII* (1531) and his *Dialogorum de Trinitate Libri II* (1532); but the public thought as little of his teaching as the theologians, and to avoid the odium which it had occasioned he changed his name to Michel de Villeneuve, from his father's native city, and went to Paris, where he began the study of medicine. In 1534 he went to Lyons, where he

brought out an edition of Ptolemy's geography (1535; 2d ed., 1541); in 1536 he returned to Paris and resumed his medical studies. In 1537 he attacked Galen and the faculty in a medical work entitled *Syruporum Universa Ratio*. As a physician Servetus possessed no small ability and practiced with success; he is believed by some to have discovered the circulation of the blood. In 1538 he went to Charlieu and in 1541 found an asylum in the palace of Pierre Paulmier, Archbishop of Vienne, supporting himself by his medical skill and literary work. In Vienne he published in 1542 a new and elegant edition of the Latin Bible of Pagninus with notes, which were not all original. At Vienne he also wrote his famous *Christianismi Restitutio* (first published, anonymously, in 1533). Its celebrity is due more to the fact that it sealed the fate of the author than to its intrinsic merits, the ideas being obscure and the style incorrect. Possibly at the instigation of Calvin, Servetus was arrested and brought to trial before the inquisition at Vienne. On June 17, 1553, he was condemned to be burned, but before this he had made his escape and was endeavoring to reach Italy. On the way he was discovered in Geneva and was imprisoned by Calvin's order. After a trial lasting two months he was condemned as a heretic and was burned at the stake Oct. 27, 1553. (For further details, see CALVIN.) On Oct. 27, 1903, an expiatory monument to his memory was unveiled in Geneva. Consult: J. S. Porter, *Servetus and Calvin* (Dublin, 1854); H. G. N. Tollin, *Das Lehrsystem Michael Servetus* (3 vols., Gütersloh, 1876–78); R. Willis, *Servetus and Calvin* (London, 1877); A. Dide, *Michel Servet et Calvin* (Paris, 1908); William Osler, *Michael Servetus* (New York, 1909). The *Restitutio* has been reprinted by Dr. Meade (incomplete, as it was suppressed by order of the Bishop of London and burned, 1723) and by Murr (Nuremberg, 1790); it has been translated into German by Spiess under the title *Die Wiederherstellung des Christenthums* (Wiesbaden, 1892–96).

SER'VIA, or **SERBIA** (Serv. *Srbija*). A kingdom in the northwestern part of the Balkan Peninsula (Map: Balkan Peninsula, C 3). Area, 33,891 square miles, which includes 15,241 square miles of new territory added after the Balkan wars.

Extending north and south across Servia is a relief of ancient crystalline rocks of an extremely irregular character; mountain masses rise to great height; at times the land forms broad, flat, undulating hills, and lofty mountains are penetrated by river valleys, which are the seats of cultivation. These valleys, where they unite with the headwaters of other streams, form the lines of communication across the Balkans. Servia lies in the path of two of these: one along the broad valley of the Morava, flowing north to the Danube through the fertile hills of Servia, from which low passes lead through the basin of Sofia to the Maretsa River and the Ægean; the other follows the Morava to an easily crossed barrier in the Shar Mountains and down the Vardar River to the Gulf of Salonika. These two great furrows have been the lines of migration and traffic across the peninsula, they have always been the sites of greatest centres of population, and they are to-day traversed by highways and railroads. The mountains of western Servia belong to the Dinaric system and present Mesozoic and Paleozoic strata. Near Novibazar stands the mountain wall of Golya-Planina (6400 feet), where the western Morava rises. The mountains of eastern Servia belong to the southern Carpathians, which is a continuation of the Banat region, and the Danube pierces here through the imposing gorge known as the Iron Gate. There mountains culminating in Suva-Planina (6600 feet) are of Cretaceous limestone and schists interrupted by volcanic stone and abound in ore strata and hot springs. The Shar Mountains, whose highest peak, Liubotrn, though never accurately measured, may be taken to overtop by hundreds of feet all other points in the Balkan Peninsula, form the water parting between the north-flowing and south-flowing streams.

Servia is a well-watered country, its waters flowing to the Danube, the Ægean, and the Adriatic seas. The Danube and its tributary, the Save, follow the northern boundary. The Drina, a tributary of the Save, and the Drin lie along the western boundary, and the Timok, an affluent of the Danube, flows about 25 miles along the eastern border. The wide, fertile valley of the Morava represents the largest cultivated territory. The climate is moderate in the Danube valley and somewhat cold in the mountains. It is healthful save in the lowlands adjacent to the Danube. The rainfall is ample, 25 inches being the annual average. The vegetation, like the climate, is more akin to that of mid-Europe than to that of the Mediterranean basin. The fauna includes the bear, lynx, and wild boar. The forests cover about one-third of the area, but are being rapidly cut down. The mineral resources are varied and of value, but there is little mining, owing to the lack of capital and roads. Over 235,000 tons of coal were mined in 1911 and 7023 tons of copper ore.

The population is almost entirely agricultural. In 1904 about 4,607,000 acres were under cultivation, nearly all tilled by the owners. There are few large farms. Modern processes in farming are slow of introduction. Cereals, with corn at the head, are the chief crops. Corn is the staple food of the people. Plums are an important crop and form, as prunes, a noteworthy item of export. Tobacco is raised in the south. Silk culture has made a good beginning. The best pastures are in the southwest. Cattle, sheep, and swine are raised extensively, oxen being used freely as work animals. At the end of 1905 horses numbered 174,363 and, at the end of 1910, 152,617; cattle, 962,503 and 957,918; buffaloes, 7450 and 7250; mules and asses, 1986 and 1622; swine, 908,108 and 863,544; sheep, 3,160,166 and 3,818,997; goats, 510,063 and 627,427; fowls, 5,022,962 and 6,742,055; beehives, 139,091 and 273,507.

The manufactures are of little importance, being chiefly native and household and confined in the main to the production of war accoutrements, cotton goods, glass, carpets, flour, sugar, beer, and spirits. The only water communication is afforded by the Danube and the Save on the northern border. The main railroad line is the Belgrade, Nish, and Vranya. At the end of 1913 there were in operation 555 kilometers of standard and 414 of narrow-gauge railway; in addition there were in the new territory 387 kilometers of standard gauge, 111 kilometers of local railway, and 105 kilometers of industrial railway; total, 1572 kilometers (977 miles). The trade of Servia (exclusive of the transit trade) in 1911 amounted to 115,425,000 dinars

imports and 116,916 dinars (see below) exports. Live stock and farm products are the leading exports.

The establishment of the National Bank of the Kingdom of Servia, at Belgrade, in 1883 marked the beginning of a new era in Servian banking. Its nominal capital is 20,000,000 dinars, of which 7,000,000 are paid up. It is empowered to issue notes, the circulation of which amounted at the end of 1913 to 103,199,317 dinars. In 1875 the French standard of money, weights, and measures was adopted. The dinar, a silver coin and the monetary unit, has a par value equal to the franc (19.295 cents). The public finances of Servia previous to the Treaty of Berlin, although not on a systematized basis, were nevertheless in a fairly good condition. As a result, however, of the cost of the wars of 1876–78 and the liabilities fastened upon the country by the Congress of Berlin and of Servia's participation in the construction of the International Railway, a large national debt was created, which at the beginning of 1913 had risen to 654,050,500 dinars.

In 1882, four years after its complete independence was acknowledged by the Treaty of Berlin, the Principality of Servia became a constitutional monarchy. A new constitution supplanting the former one of 1869 was adopted by the National Assembly in 1889. The executive power is vested in the King and in a cabinet of eight ministers, who are responsible to the King and the National Assembly. The National Assembly, or Narodna Skupshtina, consists of 169 members elected by male citizens who are at least 21 years of age and who pay annually a tax of at least 15 dinars. There is also a State Council composed of 16 members, eight appointed by the King and eight chosen by the Skupshtina, which supervises certain financial matters, hears claims against the government, and examines proposed legislation. The Great National Assembly, which convenes to act upon special matters of great moment, consists of double the number of members of the ordinary Skupshtina. The judiciary is vested in a High Court of Appeal, a Court of Cassation, a Court of Commerce, and 27 courts of first instance. For purposes of local government Servia (exclusive of the new territory) is divided into 18 departments. The capital and largest city is Belgrade (q.v.). The second city in size is Nish (q.v.).

The population on Dec. 31, 1905, was 2,688,025, of whom 1,382,318 were male and 1,305,707 female. In 1900 the population was 2,497,779, thus showing an increase of 7.87 per cent for the five years, or 1.57 per cent annually. The annual increase per cent previously was: 1885–90, 2.28; 1890–95, 1.39; 1895–1900, 1.56; 1900–05, 1.57. The estimated population at the end of 1911 was 2,957,207. In addition the population of the new territory (exclusive of the Department of Ishtib) was placed at about 1,636,000. There are very few foreigners. The state religion is Orthodox, but all other religions are tolerated. The national church is governed by a synod of bishops. Education is free in the government primary schools, but the number of illiterates is large. In 1900 only 16.99 per cent of the population could read and write. The state maintains the high schools and pays part of the expense of the elementary schools, the municipalities paying the balance. At the head of the educational system is the University of Belgrade (founded 1838), with faculties of technology, philosophy, and law.

Army. Service is universal and compulsory from 18 to 50 years of age. Liability commences at 21 and continues for 24 years. There are three categories: first, the active army and its reserve, service with the colors being for infantry 1½ years, for artillery and cavalry 2 years, then 8½ or 8 years in the reserve, making 10 years in all in the first line; second line, 6 years; third line, or territorial army, 8 years. All males between 18 and 50, except those serving in the above categories, belong to the *levée en masse*. The country is divided into 5 divisional districts, each furnishing 1 division of the active army. The division consists of 2 infantry brigades of 2 regiments of 4 battalions, a field artillery regiment of 9 batteries of 4 guns, and 1 regiment of cavalry. In addition there is a cavalry division of 4 regiments recruited at large. In war the second line furnishes 15 regiments of 3 battalions each, 5 regiments of cavalry, and a few engineer companies. In war the active army and the second line muster a field army of 10 divisions, 1 cavalry division of 4 regiments and 2 horse batteries, a regiment of mountain artillery, one of howitzers and the other necessary auxiliary services, amounting in all to about 175,000 men. The surplus reservists of the first and second line amount to about 100,000 men. The third line, or territorial army for home defense, is expected to furnish 15 regiments and a few squadrons. In all the army in war should ultimately mobilize at least 300,000 men. Arms: infantry, Mauser rifle, calibre 7 millimeters; field artillery, Schneider Canet Q. F. field gun. Budget for 1914, $958,835.

History. The land occupied by modern Servia lay chiefly in the Roman Province of Mœsia and was peopled by Thracian or Illyrian tribes. It was overrun successively by Huns, Ostrogoths, and Lombards and in the seventh century was seized by the Avars. About 637 the Serbs or Servians, a Slavonic tribe, entering the country, possibly, at the invitation of the Emperor Heraclius, to oppose the Avars, occupied it from the Save to the Balkans and from the Morava to the Adriatic. They were converted to Christianity shortly after the middle of the ninth century, and for two centuries were engaged in constant warfare with the Bulgarians, Asiatic invaders on the north. In the eleventh century the Byzantine Imperial authorities, who had hitherto allowed the Servians to retain a practically autonomous patriarchal government under their Grand Shupans, or native chiefs, sought to put more restrictions upon them. The Servians threw off the Imperial authority, and their Grand Shupan Michael (c.1050–80) proclaimed himself King of Servia and was so recognized by Pope Gregory VII. The hard struggle for independence ensued, occupying nearly three generations. In 1168 Stephen Nemanya (or Nemanja) founded a dynasty which lasted nearly two centuries. Under this dynasty the territory of Servia gradually expanded, and its power increased, reaching its height under Stephen Dushan (1331–55), when the Servian Empire, as it proudly called itself, embraced Bosnia, Albania, Macedonia, Thessaly, part of Bulgaria, and all of the Hellenic peninsula except Attica and the Peloponnesus. Dushan died before he was able to organize and consolidate his terri-

tories, and the advance of the Turks broke up the short-lived empire he had created. The dynasty of Nemanja closed with Dushan's son, who died in 1371. The battle of Kossovo in 1389 placed Servia at the mercy of the Ottomans, who were now sweeping over the Balkan Peninsula. A small body of survivors of the Servian forces found refuge in the mountainous region since known as Montenegro (Crnagora). The subjugation of Servia was completed by Sultan Mohammed in 1459. The Turkish territory comprised, besides Servia and Old Servia (Rascia, Novi Bazar), also the Bosnia and Herzegovina, in which many Serbs adopted the Mohammedan faith. The Servian country was the scene of devastating warfare between Hungary and the Turks. In 1521 Sultan Solyman the Magnificent made himself master of Belgrade. In 1718 Belgrade and part of Servia were ceded to Austria, but were retroceded in 1739. Under the rule of the Turks Servia suffered fearful oppression. The native nobility became extinct, and the Servians were reduced to a race of peasants. Many migrated to Croatia, Hungary, Dalmatia, and other countries. In 1804 the people rose under Czerny George (q.v.), or Kara George. Assisted by Russia, the Servian leader was able to win for his people a partial autonomy. The Napoleonic wars, however, compelled Russia to withdraw her assistance, and Servia was resubjected to the Ottoman yoke in 1813.

In 1815 Milosh Obrenovitch (q.v.), who had served under Kara George, suddenly headed another revolt, which proved successful, and in 1817 he was elected by the chiefs and the clergy Prince of Servia. After the disastrous war with Russia in 1828–29 Turkey granted autonomy to Servia and recognized Milosh as hereditary Prince (1830). Turkey, however, retained the right of keeping garrisons in the country. Milosh abdicated in 1839 because Russia and Turkey insisted upon a constitution which practically put the powers of government into the hands of a Senate. He was succeeded by his son Milan, who reigned but a few weeks and was succeeded by his brother Michael. A strong party opposed to the Obrenovitch dynasty deposed Michael in 1842 and made Alexander, son of Kara George, Prince. (See CROATIA AND SLAVONIA; GAJ.) Alexander Karageorgevitch, however, had no patriotic aspirations, but was wholly under the influence of Austria and the Porte, and was deposed in 1858. The aged Milosh was recalled and in 1860 died, being again succeeded by Michael, who developed the idea of uniting in one nation all the Serbs, who are the main body of the population in Bosnia, Herzegovina, and Montenegro, as well as Servia. He secured the withdrawal of all Turkish garrisons from Servia in 1867 and was on the point of accomplishing even more in the direction of nationalization and independence when he was assassinated by adherents of the rival house of Karageorgevitch in 1868. As Michael had no direct heir, the Skupshtina, or Senate, proclaimed his cousin, Prince Milan, who attained his majority in 1872. Under the guidance of the Prime Minister Ristić (q.v.) Servia obtained a constitutional organization, with a Council of State, and the Skupshtina was transformed into a Chamber of Deputies, elected by proportional representation. In July, 1876, Servia declared war against Turkey, being joined by Montenegro. The Servians, generally unsuccessful, notwithstanding the help of numerous Russian volunteers, were totally defeated at Diunis and Alexinatz in October. An armistice followed, and a treaty of peace was signed March 1, 1877. In April Russia declared war against Turkey (see RUSSO-TURKISH WAR), but Servia did not venture to take the field until the fall of Plevna had virtually decided the war. The complete independence of Servia was established by the Treaty of Berlin (see BERLIN, CONGRESS OF), which also gave the country an increase of territory. In 1882 the principality was proclaimed a kingdom. In 1885 war was declared against Bulgaria, but the Servian army, though larger and better equipped than that of the enemy, was defeated by the military genius of Prince Alexander of Bulgaria (q.v.), and Servia was invaded. Peace was secured through the intervention of Austria-Hungary. King Milan, who had sought to strengthen his position by promulgating a liberal constitution (January, 1889), dissatisfied with the democratic course of the radicals, abdicated March 6, 1889, in favor of his son Alexander I (q.v.), who dispensed with a regency in 1893.

Alexander began at once to act the autocrat. In 1894 he recalled his father to assist him against his radical ministers and by proclamation restored their full privileges to his father and mother, Natalie. On May 21 he abolished the liberal constitution of 1889, restoring that of 1869. In 1900 he married Draga Mashin, in defiance of his father's wishes. Milan was once more exiled, and Alexander began a period of high-handed personal rule which aroused intense hostility among the most influential persons in the Kingdom. In April, 1903, King Alexander abrogated the constitution, changed the ministry and the laws, and then restored the mutilated constitution to operation. This was a process attended with some peril in a country where liberalism and even republicanism had been growing. A conspiracy was formed by leading officers of the army, and on June 11 the palace was entered, and the King, the Queen, two of her brothers, two of the cabinet, and some 50 other persons were assassinated. The regicides restored the liberal constitution of 1889 and placed Peter, grandson of Kara George, upon the throne. (See PETER I KARAGEORGEVITCH.) For a number of years there was conflict between the party of the regicides and those who insisted on their punishment.

After King Peter's accession the idea of a Great Servia that would include all the countries inhabited by the Serb race again possessed the Servian patriots, who saw in Austria-Hungary their country's archenemy. This hostile feeling was intensified by the protective-tariff policy adopted by the Dual Monarchy. When in 1908 Austria formally annexed Bosnia and Herzegovina, the Servian government retaliated with tariff warfare and countenanced warlike preparations; it was prevailed upon, however, by Russia to promise solemnly (1909) "to live on good neighborly terms with the Dual Monarchy." The tension with Austria-Hungary was temporarily lessened by this promise and also by an opportunity which the Servians soon found to realize part of their national aspirations at the expense of Turkey. Taking advantage of the unrest in Macedonia and Albania which followed the Turkish revolution of 1908–09, and of the Turco-Italian War (q.v.) of 1911–12, Servia in 1912 entered into the Balkan alliance with Bulgaria, Greece, and Montenegro and helped to precipitate the Balkan War (q.v.)

of 1912–13. By the terms of the Treaty of Bucharest (August, 1913), closing the Balkan War, Servia almost doubled her territory and increased her population by more than a half.

The gains of Servia in the Balkan War were at the expense quite as much of Bulgaria as of Turkey, and one outcome was increased bitterness between Serbs and Bulgarians in Macedonia. The chief reason for this situation lay in the attitude of Austria-Hungary, which, in order to prevent Servian expansion to the Adriatic, had already, in the course of the Balkan War, obliged the Serbs to surrender Durazzo and other western conquests to the newly created principality of Albania and had thereby caused the Serbs to seek compensation in Macedonia. The Servians' hatred of Austria-Hungary now increased and was brought to a crisis when Archduke Francis Ferdinand, heir to the Hapsburg thrones, was assassinated (June 28, 1914) at Serajevo, the capital of Bosnia, by Serb conspirators possessed of the passion of nationalism. Thus it was as a phase of Servia's relation to the Near Eastern Question that the European War began in 1914. In view of the international situation created by the Balkan War, it was well-nigh inevitable that Bulgaria should throw in her lot with Austria-Hungary and Germany (in October, 1915) and undertake to despoil Servia. See WAR IN EUROPE.

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SERVIAN LANGUAGE. See SERBO-CROATIAN LANGUAGE.

SERVIAN LITERATURE, or SERBO-CROATIAN. **Old Period—Old Church Slavic** (to the first half of the fifteenth century in the west and the seventeenth, inclusive, in the east). The earliest literature was in the Old Church Slavic (q.v.) language, written with either Cyrillic or Glagolitsa (qq.v.) characters. With the twelfth century a differentiation gradually came into being: in the Greek Orthodox east the Servians adhered to the Old Church Slavic—modified to a certain extent by their own idiom—and the Cyrillic alphabet, while in the Catholic west, especially in Dalmatia, preference was given the Glagolitic (and at a later period the Latin) alphabet, and the vernacular made its appearance in legal documents and religious poetry and at length supplanted the Church Slavic except in liturgy. The literature of this period consisted chiefly of prose translations from Greek, and in the west also from Latin and Italian, sources. Most of the books produced were ecclesiastical, although legal, historical, and various didactic works are met with. There were also a few prose romances of western and Oriental origin. More claim to originality attaches to the *Lives* of prominent Servians, rulers, and saints. Among the diplomatic, historical, and judicial monuments of the period the Vinodolian Statutes (1288) and King Dushan's Code (*Zakonik*) are particularly important for the purity of their language and the light they throw on the social organization of the Serbo-Croatians. Interesting, too, are the writings of the Bogomiles (q.v.), embodying the feelings and ideas of those Slavs who were dissatisfied with Byzantine formalism.

The Turkish conquest proved a tremendous obstacle to the cultivation of letters among the Servians. Although printing presses were established in Montenegro (1493) and afterward in Servia, their activity did not last long, owing to Turkish interference. The most enlightened of the Servian prelates, such as the famous Gregori Tsamblak, migrated to Russia. The only literary activity manifested in Servia until the next period consisted of the copying of older religious texts and the writing of a few chronicles.

Middle Period (end of the fifteenth to the eighteenth century, inclusive, in the west; eighteenth century in the east). Turkish oppression was less felt in Dalmatia. Under the influence of Italian humanism and of the literary movements which followed it there arose a great number of eminent writers who centred about the half-Slavic, half-Italian Commonwealth of Ragusa (Dubrovnik) in south Dalmatia. Among the best-known vernacular poets of this group are the Petrarchist Hannibal Lucić of Traù (1480–1534); the writer of idylls P. Hektorović of Lesina (1487–1572); the profoundly religious M. Vetranić (1489–1576); the great I. F. Gundulić (1588–1638) (q.v.); the versatile Gjon Palmotić (1606–57); and Ignjat Gjorgjić (1657–1737), a follower of Giambattista Marini (q.v.). The drama was cultivated with success, being represented by some of the poets just mentioned, Marko Marulić (q.v.), and the prose writer Marin Držić. Many of the Ragusans also wrote in Latin and Italian. Ragusa saw a period of literary and commercial decline following the end of the seventeenth century. Throughout this period its literature exercised a profound influence not only among the Slavs of Dalmatia, by whom it was imitated, but also on the Catholics of the interior.

Owing to the extreme peculiarities shown by

the Ragusan dialect and to its relative numerical insignificance, the Jesuit and Franciscan religious writers chose the Bosnian dialect as their literary medium. Their most popular representatives were M. Divković (1563–1631), Stjepan Margitić, and T. Babić (fl. 1736). Most of the Catholic works of edification were printed at Venice with Cyrillic or Latin characters.

In Croatia and Slavonia, which felt the literary influence of Germany and Austria-Hungary, there appeared, besides lexicographers, historians, and Protestant and Catholic apologists (such as the once famous Slavonian Jesuit Kanižlić, 1700–77), a number of epic poets, such as P. Ritter-Vitezović (died 1713) and the pseudoclassical Katančić (1750–1825), a Slovenian Franciscan. The less learned but more popular Antun Relković (1732–98), a soldier, wrote for the instruction of his people a moral poem, entitled *The Wild Man.* Nearer to the people, and the greatest South Slavic poet of the eighteenth century, was the Dalmatian Andrija Kačić-Miošić (1702–60), who sang the heroes of his race in famous *Discourses.* It is worthy of note that several Dalmatian and Slovenian writers had more or less Panslavist ideas. See KRIZHANITCH.

Servia. The wholesale migration of Servians to Austria-Hungary in 1690, and again in 1737, and Austrian occupation (1718–39) helped the spreading of western ideas among the Servians. On the other hand Russian books and teachers prevented the total loss of Servian letters. Under their influence books were written in the so-called Slaveno-Servian language, a mixture of Church Slavic, Servian, and Russian forms.

The names most prominent during the eighteenth century are those of Jovan Rajić (1726–1801), who wrote a *History of the Slavic Peoples, especially the Bulgarians, Croatians, and Servians* (1786; last ed., 4 vols., Buda, 1823), and Obradović (c.1742–1811) (q.v.), the pioneer of modern Servian. His ideas, broadened by constant travel, had a salutary effect, while his style, although still laden with Russian and other non-Servian expressions, is quite flexible, often graceful, and exhibits a preponderance of purely Servian words.

Modern Period (romanticism to realism; nineteenth century). The first half of the nineteenth century, which witnessed the triumph of romanticism and national idealism, was marked by the literary labors of the great Karadžić (1787–1864) (see KARAJITCH), the "father of modern Servian." He employed the pure Servian of the common people (the South Shtokavian dialect) with such art, force, and purity that it was finally accepted as the standard. The sentimental novels of Milovan Vidaković (1780–1841), the pseudoclassical odes of Musicki (1777–1837), and the epics of Milutinović Sarajlya (1791–1848) gave way to the more national, realistic, and lifelike writers of the stripe of Branko Radicević (1824–53). Of his poems the best are *The Pupil's Parting* and *The Path.* Another distinguished poet is the last vladika of Montenegro, Peter II Petrovitch Njegoš (1813–51), whose most important work is the *Mountain Crown,* a poem in dramatic form, relating the slaughter of the Mohammedanized Montenegrins by their Christian brethren about the end of the eighteenth century. His example was followed by Prince Nikola I (Nicholas of Montenegro), author of lyrics and dramas. The most popular poets are Zmaj Jovan Jovanović (1833–1904), the several Ilijć (q.v.), and the romantic Gjura Iakšić. The most distinguished of the modern poets are the philosophic Laza Kostić (1841–1910), M. Mitrović (1867–1907), Miloš Cvetić (1845–1906), the symbolist Svetislav Stefanović (born 1877), Aleksa Santić, Jovan Dučić, and the Parnassian Milan Rakić. Several are at once poets and dramatists, notably Kostić and Stefanović (both of whom, in addition to original plays, translated from Shakespeare), Cvetić, and Dragutin Ilijć. The earlier writers of drama and tragedy belong to the nationalistic school: such were the poet Subotić; Matija Ban (1818–1903) of Ragusa, author of *Mejrima, or the Bosnians* and other historic plays; Gj. Maletić (1816–88); and J. Popović Sterija (1806–56), more noted for his comedies. The comedy of intrigue is represented by Kosta Trifković (1843–75), M. Glišić (died 1908), and B. Nušić (born 1864). Judging by the attempts of Atanacković (1816–58), the poet Jakšić, J. Ignjatović (1824–59), and Sapčanin (1841–95), the Servians have not been successful in novel writing. They excel, however, in short stories and sketches abounding in local color and told in idiomatic and picturesque language. The best prose writers include Laza Lazarević (1851–91), whose types are mostly taken from the provincial Servian town; M. Militchevitch (q.v.), whose stories from real life have the accuracy of photographs, and Janko Veselinović (1862–1904), authors of village tales; the poet Ljuba Nenadović (1826–95), who also wrote travel stories and interesting memoirs; St. M. Ljubiša (1824–78) and Simo Matavulj (1852–1908), who lay out their scenes in Dalmatia; the Montenegrin Ilija Vukičević (1866–99); the Macedonian Svetozar Corović (born 1873); the very popular Borisav Stanković (1876–); Svetislav Marković, author of the *Mountain King;* the historical novelist Mijatović (see MIJATOVICH); the humorous Servian Dickens, Stevan Sremac (1855–1906); and the caustic Radoje Domanović (1873–1908).

As a result of the Illyrian movement represented by Gaj (q.v.) and others, the literary bonds of union between the Servians and Croatians were strengthened, both using the same literary language. (See SERBO-CROATIAN LANGUAGE.) Among the nationalist and romantic Croatian writers, whose activity extended over the middle of the nineteenth century, mention must be made of Stanko Vraz (1810–51) (q.v.), Kukuljević-Sakčinski (q.v.), Marko Bogović (1816–95), the great epic poet Ivan Mažuranić (1814–90), and the great lyrist Preradović (q.v.), author of the fine poem *The Traveler* (*Putnik*). In the second half of the nineteenth century the Croatians became as a rule more cosmopolitan, and their works show traces of Czech, German, French, Russian, and Italian influence. A series of poets and dramatists of great talent includes Franjo Marković (born 1845), A. Tresić-Pavičić (born 1876), M. Begović (Xeres de la Maraja), Ivo Vojnović (1859–) of Ragusa, author of a *Ragusan Trilogy,* and others. The greatest of the modern poets is the profound and humanitarian Silvije Kranjčević (1865–1908); others are Gjuro Arnold (born 1851), the patriotic Bosnian Harambašić (born 1861), the Dalmatian M. Nicolić, and Vidrić. The novel and short story have been successfully cultivated by writers like August Senoa (1838–81), J. E. Tomić (1843–1906), Kumičić-Sisolski (died 1904), the austere Ko-

zarac (1858–1906), the tender Leskovar (born 1861), V. Novak, A. Matoš, and the great realist Ljubomir Babić, better known as Xaver Sandor Gjalski (1854–), whose portrayal of the old Croatian landed gentry is worthy of Sienkiewicz. The literary centre of Croatia is Agram (Zagreb), which is the location of the literary society known as Matica Hrvatska. See STROSSMAYER.

The critical, historical, and scientific literature of the Serbo-Croatians is very extensive. A few of the most illustrious names include the natural philosopher Bošković (see BOSCOVICH), the Protestant theologian and historian M. Flacius (q.v.), Illyricus, the botanist J. Pančić (1814–88), the philologist Gj. Daničić (died 1882), and numerous historians, such as Kukuljević-Sakčinski (q.v.) and Ilarion Ruvarac (1842–1905). Among the living are the historians Stojan Novaković (q.v.), St. Stanojević, Ljuba Jovanović, etc., the philologist V. Iagić (q.v.), the ethnologist J. Cvijić, the metaphysician B. Petronijević, two physicists residing in the United States, N. Tesla and M. Pupin (qq.v.), and others.

The **oral (popular) literature** falls into two main divisions with regard to subject matter: (*a*) the so-called yunak (*junak*, brave, hero) songs, epic in character, relating the achievements of the national heroes; (*b*) the feminine and erotic, lyric in nature, dealing with the softer sides of the nation's life. Other songs accompany dancing. In the epic (*junak*) songs the four chief periods of Servian history are easily discernible: those composed in the earliest period, exhibiting the earlier strata of mythology overrun by and intermingled with later Christian elements; those narrating the glorious period of the Nemanya dynasty (from the twelfth to the fourteenth century); the songs depicting the loss of Servia's independence at Kossovo (1389) and subsequent events, centring about the heroic figure of Prince Marko (Marko Kraljević); the songs of modern times of the struggle for independence at the outset of the nineteenth century, including commemorations of the great leader Kara (or Black) George, and the Montenegrin uprisings, etc. There are also religious and semireligious songs, incantations, etc. This form of literary production is still going on.

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SERVIAN POLITICAL PARTIES. See POLITICAL PARTIES, *Balkan States*.

SERVIAN WALL (Lat. *agger Servii Tullii*). The first inclosing wall built about ancient Rome in the historical period, the construction of which is assigned to Servius Tullius (q.v.). The wall was constructed against one of the cliffs forming the face of the Capitoline, Quirinal, Oppian, Cælian, and Aventine hills, crossing the narrowest parts of the valleys between and reenforced at its weakest points by an agger consisting of an embankment with an outer wall and ditch. The whole course of the Servian wall and the position of the gates have been definitely ascertained by excavations made since 1860. Consult R. A. Lanciani, *Ancient Rome in the Light of Recent Discoveries* (Boston, 1889), and S. B. Platner, *The Topography and Monuments of Ancient Rome* (2d ed., ib., 1911).

SERVICE, DOMESTIC. See DOMESTIC SERVICE.

SERVICE, SECRET. See SECRET SERVICE.

SERVICE, ROBERT WILLIAM (1876–). A Canadian poet and novelist. He was born at Preston, England, and was educated in Glasgow, where he entered the employ of the Commercial Bank of Scotland. Later he went to Canada and settled on Vancouver Island, British Columbia. For a time he engaged in farming, then traveled extensively along the Pacific coast, meeting with adventures that furnished him literary material. He became a member of the staff of the Canadian Bank of Commerce in 1905, was transferred to the bank's branch at White Horse, Yukon Territory, and then to Dawson City. Familiar through travel with the sub-Arctic regions, he infused into much of his verse an elemental vigor characteristic of wild scenes and of the rough, passionate miners, trappers, and hunters with whom he came in contact. He published: *Songs of a Sourdough* (1907); *Ballads of a Cheechako* (1909); *The Trail of '98* (1910), a novel; *Rhymes of a Rolling Stone* (1912); *The Pretender* (1914), a novel.

SERVICE BERRY (Lat. *sorbus*, service tree), *Pyrus sorbus*. A slow-growing but long-lived tree of the family Rosaceæ, native of Europe, Africa, and Asia. It grows about 50 feet tall, has pinnate leaves and large flowers, and bears pear-shaped fruits 1 to 1¼ inches long, for which it is cultivated in central and southern Europe. The fruits are usually eaten in a state of incipient decay. The heavy, fine-grained, strong, durable timber, which can be highly polished, is valued for machine making. In the United States the name is often applied to the

shadbush (q.v.). See AMELANCHIER; BEAM TREE.

SERVICE OF PAPERS AND PROCESS (OF. *servise, servicé*, Fr. *service*, from Lat. *servitium*, service, servitude, from *servire*, to serve). It is fundamental in law that no final judicial action shall be taken against a person unless he is notified of the steps to be taken against him and given an opportunity to present his side. This doctrine applies to both civil and criminal proceedings. In some jurisdictions the summons or other primary process is served personally on the defendant, and subsequent pleadings and other papers in the action are filed with the clerk of the court. This is true generally under the common-law system. Modern codes, however, generally require that each pleading, notice, or other paper relating to the action shall be served upon the attorney for the opposite party or the party himself, even though they must also be filed. Some codes provide that service of the pleadings and other papers after the first process may be made by mail on the attorneys for the respective parties.

Criminal process must be served by an authorized person, usually a representative of the sheriff or prosecuting attorney, or an officer of the court. However, in most States civil process may be served by any person not having an interest in the action and of suitable age, but in a few jurisdictions a private individual must be specially authorized for valid service.

The time of service of papers is governed by the practice acts and rules of court in each State. Papers or process cannot be served on a day which is strictly a *dies non* (q.v.), but unless the service of papers on holidays is prohibited by statute, this will be deemed valid. In computing time within which papers must be served Sunday is included, unless it falls on the last day of the time allowed, in which case in some jurisdictions the next legal day is added.

Service must be made within the territorial jurisdiction of the court. Where an action is to be begun against a nonresident, or where a resident of the State leaves it to evade service of process or secretes himself with like purpose, most jurisdictions provide that service may be made by publication. This is done by order of the court; the summons or other process is published in designated newspapers in the county in which the action is taken, and also mailed to the defendant's last known address, or tacked on his door if he reside within the county. The plaintiff in such cases is usually allowed the alternative of serving the defendant personally without the State. Service by publication, or without the State, will not give a court the jurisdiction necessary to support a personal judgment in the sense of obliging courts in other States to give faith and credit to it. However, as a State has jurisdiction over all property within its limits, irrespective of ownership, it is held that a judgment obtained after such service will be good as against any property of the defendant within the State.

Requisites of proper service are governed by local acts in each State. Common requirements are that the papers or process be handed to the person intended to be served, and often that their nature or contents be stated to him. If the person thus served throws down or refuses to receive the paper, the service is complete if it be laid on his shoulder or put down in his presence and its nature explained to him. Some practice acts require that certain judicial papers or orders be read to the person served or the judge's signature exhibited. Where there are several defendants each one must be served individually, but where action is against a copartnership service on one member is sufficient. Service is made on a corporation by serving one officer or a director or, if a foreign corporation, a representative within the State.

Ignorance of the effect of service will not avoid the consequence of noncompliance with the contents of the papers or the rules of court.

In certain instances a person is immune from service of process, as in the case where a witness in an action comes voluntarily within the State to testify. Public policy makes such a rule necessary, and service of either a summons or other process of the court under such circumstances will be void. See PLEADING; PROCEDURE.

SERVICE SCHOOLS AND ARMY STAFF COLLEGE. A title given to the five United States army service schools located at Fort Leavenworth, Kans. These schools are now (1916) known as the Army Staff College, the Army School of the Line, the Army Signal School, the Army Field Engineer School, and the Army Field Service and Correspondence School for Medical Officers. The term "service schools" also includes a number of other military schools for the further technical and professional education of military officers of the United States army, situated as noted below. Subsequent to the declaration of war with Spain in 1898 there were appointed in the line of the army 1542 lieutenants, in addition to those appointed from the Military Academy. Of this number 616 had previously served as officers of volunteers, 414 were appointed from the ranks of the regular and volunteer regiments, and 512 were appointed from civil life. At the conclusion of hostilities Congress made provision for the reopening of the army schools for commissioned officers, which had of necessity been closed during the war, and at the same time enlarged and developed the Fort Leavenworth school. Every effort was put forth to bring the standard of technical and professional proficiency of the officers above mentioned up to that of the West Point graduate. In addition to the five service schools at Fort Leavenworth, Kans., the government also maintains the following: the Army War College, Washington, D. C.; the Coast Artillery School, Fort Monroe, Va.; the Engineer School, Washington Barracks, D. C.; the Mounted Service School, Fort Riley, Kans.; the Army Medical School, Washington, D. C.; the School for Bakers and Cooks, Washington Barracks, D. C.; the School for Bakers and Cooks, Presidio of San Francisco, Cal.; the School of Fire for Field Artillery, Fort Sill, Okla.; the School of Musketry, Fort Sill, Okla.; the Signal Corps Aviation School, San Diego, Cal. See MILITARY EDUCATION.

SERVICE STRIPES. See CHEVRONS; MILITARY INSIGNIA.

SERVIÈRES, JEAN GROLIER DE. See GROLIER DE SERVIÈRES, JEAN.

SER'VITES (from Lat. *servus*, slave) (SERVANTS OF MARY). A Roman Catholic monastic order founded in Florence in 1240 by seven prominent merchants, who desired to advance the glory of the Virgin Mary, and confirmed by Pope Innocent IV in 1249. Its rule is Augustinian. In 1288 it had some 10,000 members. In the lifetime of the founders it entered France and Germany and in the next century Spain, but its in-

troduction into England was not till 1864. Thence in 1870 the order came into the United States, where in 1908 the American province was established. It had in 1914 seven houses in the United States and one in Canada, with 35 fathers, 33 clerics, and 15 lay brothers. In 1910 the order had in all 62 monasteries with 700 members. Besides the monks there are nuns of this order, with (1914) 63 sisters in the United States. Consult Sporr, *Lebensbilder aus dem Servitan-Orden* (Innsbruck, 1892).

SER'VITUDE (Lat. *servitudo*, from *servus*, servant, slave). In the Roman law, a right to use property which belongs to another. In English and American law the use of the word "servitude" is as a correlative of "easement." Servitudes are classified as prædial and as personal. The former are annexed to land: the right belongs to the owner of a dominant piece of land and is exercised over a neighboring servient piece of land. Prædial servitudes are further subdivided into rustic and urban. The former include rights of way and of drawing water from or over neighboring land. They also include the right to take something of value from the land of another, such as wood and lime, in which instance the right is sometimes called a *profit à prendre* (q.v.). The urban servitudes are annexed to residential property: they include rights of support from an adjoining building, of discharging rain water on adjoining premises, and restrictions on the height of neighboring buildings. The prædial servitudes are of unlimited duration. Personal servitudes are established in favor of a particular person, without reference to his ownership of land, and may be exercised over immovable property or over movables. They are rights of more or less complete use and enjoyment, regularly limited to a single life. The most important personal servitude is a usufruct. A very important restriction upon servitudes is that the owner of servient property need not do anything. His duty is confined to inaction or toleration. The only exception is found in the urban servitude of support from an adjoining building. This obliges the owner to keep his building in repair.

Servitudes may be established by contract (accepted grant), by testament, by judicial decree in a partition suit, or by prescription. They may be extinguished by contract (accepted release) and by confusion or merger when the ownership of the servient property and the special right conferred by the servitude are united in one person. Personal and rustic servitudes may be lost by nonuser of long duration; urban servitudes are so lost only when the owner of the servient estates prescribes his liberty (see PRESCRIPTION), which means that he must maintain for 10 or 20 years a state of things inconsistent with the servitude.

In modern civil law it is possible to charge periodical payments upon land, but with this exception the modern European doctrine of servitudes is substantially like the Roman.

General restrictions imposed by law upon use of property, especially when in the interest of neighbors, are sometimes called legal servitudes.

The term "servitude" was also applied to the status of transported laborers marked by temporary loss of liberty due to service obligations under contract. Developed chiefly in English and French seventeenth and eighteenth century colonies, negro, Indian, and white servitude was analogous to recent subject labor in Cuba, South America, South Africa, and Hawaii. For two centuries (1619–1819) in America servitude was an important social institution, especially for skilled labor supply. It long endured in agricultural Pennsylvania, Maryland, and Virginia, furnishing high-grade labor a century after slavery replaced it. Indented or indentured servitude started as a free personal relation based on voluntary contract for a term of service. It tended to pass into a property relation (1) in which was recognized only the involuntary and indefinite service obligation enjoined by law in England or the Colonies or procured by force through the kidnaping of persons in Great Britain, called spiriting; and (2) in which extensive control was asserted over the bodies and liberties of the person during service. The master's right to service of both voluntary and involuntary servants was supposed to be based upon contract, written or oral, in the form of court sentences, act of Assembly, or according to the custom of the country. Early statutes recognized servitude in Virginia, 1619; Massachusetts, 1630–36; Maryland, 1637; Connecticut, 1643; Rhode Island, 1647; North Carolina, 1665; Pennsylvania, 1682; Georgia, 1732. Incidents added by law were: master's alienation by gift, sale, or will; rating in assets; seizure for debt; two to seven year additions to service; whipping and fetters for control; consent to marriage, property ownership, trade, and assembly; servant's rights to freedom dues, certificate of freedom, suit and complaint by petition, commutation for punishment, free time, medical attention, and, if white, nonservice to colored persons and infidels. Servants (kids, redemptioners, indented) included younger sons of nobility; political prisoners; religious malcontents; vagrants; convicts; German, Swiss, French, and Dutch peasants; negroes and Indians. Servitude declined as slavery developed, but a white-servant trade lasted until 1819. Consult authorities under CIVIL LAW and REAL PROPERTY. See REAL PROPERTY; EASEMENTS.

SERVITUDES. See INTERNATIONAL LAW, *Jurisdiction.*

SERVITUDES, URBAN. See URBAN SERVITUDES.

SER'VIUS MA'RIUS (or MAURUS), HONORATUS. A Roman grammarian of the fourth century. His most celebrated work is his commentary on Vergil, which contains copious and valuable notes on Greek and Roman history, religion, and mythology. The commentary was edited by Thilo and Hagen (3 vols., Leipzig, 1881–1902). Consult: E. Thomas, *Essai sur Servius* (Paris, 1880); Henry Nettleship, *Lectures and Essays, First Series* (Oxford, 1885); Martin Schanz, *Geschichte der römischen Litteratur*, vol. iv, part i (2d ed., Munich, 1914).

SERVIUS TULLIUS. See TULLIUS, SERVIUS.

SESAME, sĕs'ā-mē. See SESAMUM.

SESAME GRASS. See GAMA GRASS.

SES'AMOID BONE (Gk. *σησάμη, sēsamē*, sesame + *εἶδος, eidos*, form). A small bone developed in the substance of a tendon near certain joints. In the human subject the patella is the best example.

SES'AMUM (Lat., from Gk. *σησάμον, sēsamon*). A genus of about 12 species of African or Indian annual hairy herbs, called sesame, gingili, bene, til, etc., of the family Pedaliaceæ. The species are so similar as to be sometimes reckoned mere varieties of one species, *Sesamum indicum*. The sweet oleaginous seeds are used

in Central Africa for making pudding. In Egypt they are eaten strewed on cake. The bland, long-keeping, fixed oil obtained from them is used as a food, like olive oil, and by the women of Egypt as a cosmetic. From ancient times it has been cultivated in India, China, Japan, and many tropical and subtropical countries. It is one of

SESAMUM INDICUM.

the quickest plants to yield returns. The oil cake, mixed with honey and preserved citron, is an Oriental luxury. The leaves of *Sesamum* abound in mucilaginous substance, which they readily impart to water, making a rich bland mucilage, used in the southern parts of the United States as a demulcent drink. The seeds are also used in confectionery.

ŚESHA, shā'shà (Skt. *śēṣa*, remainder, serpent). In Hindu mythology, the king of the divine serpent race, sprung from Kadru, wife of the sage Kasyapa. Vishnu (q.v.) sleeps on him as he floats upon the primeval waters. Sesha's thousand heads serve as a canopy to the god, and upon this hood rests the world. His yawn causes the earthquake, and by the fire from his body the world is destroyed at the end of each kalpa (q.v.). Consult E. W. Hopkins, *Religions of India* (Boston, 1895).

SESI, sā'sê, or SESI DE LO ALTO. The market name in Havana of an excellent food fish (*Neomœnis*, or *Lutjanus, buccanella*), one of the pargos or snappers. It is prevailingly crimson and orange in color, marked by a jet-black spot at the base of the pectoral fin, whence its other names, oreille noire (black ear) and black-fin snapper. It is known in Martinique as buccanelle.

SESOS'TRIS (Lat., from Gk. Σέσωστρις). The Greek name of a king of Egypt whose exploits are related by Herodotus, Diodorus, and other writers of antiquity. According to them the father of Sesostris, having learned by an oracle that his son was destined to attain universal empire, had him educated in all warlike accomplishments along with 1700 Egyptian boys all born on the same day with the Prince. On his accession to the throne Sesostris fitted out a great army, officered by his 1700 comrades, and set forth to conquer the world. After conquering Ethiopia and marching to the farthest limits of India he turned westward, subduing all lands in his progress through Asia, traversed Asia Minor, invaded Europe, and subjugated Scythia and Thrace. Now master of the known world, he devoted the rest of his reign to improving the condition of his country and at the same time sought to perpetuate his fame by erecting magnificent buildings inscribed with his name and deeds. He divided Egypt into 36 nomes, constructed an extensive system of canals for irrigating the land, divided the population into castes, and fortified the country against invasion. He became blind in his old age and took his own life. It has long been recognized that Sesostris was not an historical personage. His name is apparently derived from the Egyptian name Senusert (i.e., Usertesen), and it is probable that one of the kings of the twelfth dynasty was the original hero of the legend. There is a possibility that the great Hyksos King Khian, whose prænomen might be pronounced Swesereurē, is the source from which the character was drawn. In later times, however, the boastful incriptions of Rameses II (q.v.), inscribed upon the walls of numerous temples, seem to have led to the identification of that monarch with the popular hero. Consult: Wiedemann, *Aegyptische Geschichte* (Gotha, 1884–88); Meyer, *Geschichte des alten Aegyptens* (Berlin, 1887); Sethe, *Sesostris* (Leipzig, 1900); E. A. T. Wallis Budge, *A History of Egypt* (New York, 1902).

SESSA AURUNCA, sĕs'sà ou-rōōn'kà. A city in the Province of Caserta, Italy, situated on an extinct volcano, 32 miles north-northwest of Naples (Map: Italy, E 4). It has an ancient cathedral and a seminary. There are ruins of an amphitheatre. The city is famous for its wine from the vineyards of the neighboring Monte Massico, a vintage much lauded by Horace and Vergil. Other products are olive oil, fruits, grain, and cheese. Many cattle are reared. The ancient Suessa Aurunca became a Roman colony in 313 B.C. Pop., 1911, (town) 5945, (commune) 20,156.

SESSION, COURT OF. See COURT OF SESSION.

SESSIONS, QUARTER. See QUARTER SESSIONS.

SESTERTIUS, sĕs-tĕr'shĭ-ŭs (Lat., half of the third, i.e., two and one-half, from *semi-*, half + *tertius*, third). A Roman coin. When silver coinage was introduced in Rome (268 B.C.) with the copper *as* as a unit, the silver sestertius was valued at 2½ asses. The standard as (q.v.) now retained only one-fourth of its original weight; hence the sestertius was equivalent to the original libral as; and, as accounts had formerly been made in terms of the libral as, so now they were made in terms of sestertii. After the First Punic War, however, the sestertius ceased to be coined. The weight of the as was many times reduced; the denarius was finally (217 B.C.) made equal to 16 asses, and the sestertius to four asses. With the reorganization of the coinage under Augustus a copper sestertius of four asses was coined under the control of the Senate; this was about four cents in United States money. Though the sestertius ceased to be coined, sums of money were counted in sestertii and large sums in sestertia or thousands of sestertii; thus, 10 sestertia equal 10,000 sestertii. Consult G. F. Hill, *A Handbook of Greek and Roman Coins* (London, 1899). See NUMISMATICS, *Roman Coins;* also NUMISMATICS, Plate II.

SES'TIUS, PUBLIUS. A Roman patrician. In 63 B.C., as quæstor, he aided Cicero in sup-

pressing the conspiracy of Catiline (q.v.). In 57, as tribune, he helped recall Cicero from exile. Through Albinovanus he was accused by Clodius in 56 of using illegal force during his tribunate. He was defended by Hortensius and Crassus and by Cicero (whose speech is extant) and was acquitted, largely through the influence of Pompey. Sestius was prætor in 53. In the Civil War he sided at first with Pompey, but afterward joined Cæsar.

SES'TO, CESARE DA (c.1477–c.1523). A Milanese painter. He was born at Sesto Calende and was a pupil of Leonardo da Vinci. Though influenced later by Raphael, he retained the suavity and mannered grace of Leonardo's followers and, while cold and self-centred, was a remarkable technician. Among his best works are: "Madonna" and "St. Jerome" (both in the Brera, Milan); "Adoration of the Magi" (Naples Gallery); "Virgin with the Scales" (Louvre); "Salome" (National Gallery, London). He is also represented in the Walters Gallery, Baltimore, and in the Johnson collection, Philadelphia. A fine series of his drawings is in the Morgan collection, New York.

SESTRI LEVANTE, sĕs'trê lå-vän'tå. A seaport in the Province of Genoa, Italy, 30 miles by rail southeast of Genoa (Map: Italy, C 3). It is a sea-bathing and winter resort, has an old castle, anchovy and oyster fisheries, and manufactures of lime and olive oil. Pop., 1911, (town) 3057, (commune) 12,912.

SESTRI PONENTE, pô-nĕn'tå. A seaport in the Province of Genoa, Italy, 5 miles by rail west of Genoa (Map: Italy, B 2). It has fine villas, a technical school, and a music school. It manufactures machinery, matches, and tobacco, and carries on shipbuilding. Pop. (commune), 1901, 17,187; 1911, 17,205.

SET (Gk. *Σήθ, Sēth*). An Egyptian deity, the son of Seb and Nut and the brother of Osiris, Isis, and Nephthys, the latter being his wife. In the legend he endeavors to thwart the beneficent plans of Osiris and, failing in this, treacherously murders him. So implacable is his hatred that he even persecutes his brother's body, tearing it into pieces and scattering them far and wide. But Horus, the son of Osiris and Isis, is safely guarded by his mother from the evil designs of Set, and on attaining maturity he takes vengeance for his father's murder. According to the popular conception Set was the personification of evil and of darkness; hence he was the god of the inhospitable desert and of foreign countries hostile to Egypt. At Tanis he was held to be the solar deity who pierced with his lance the Apep serpent, and he was called "the beloved of Re"; and at Ombos, where he was worshiped in very early times, he was revered as lord of the South and was occasionally identified with the crocodile god Sobk (q.v.). In the Pyramid Texts he appears closely associated with Horus and as the friend of the dead. By the Greeks Set was called Typhon (q.v.) and was identified with the giant of that name. Consult: Meyer, *Set-Typhon* (Leipzig, 1875); Brugsch, *Religion und Mythologie der alten Aegypter* (ib., 1888–90); K. A. Wiedemann, *Religion of the Ancient Egyptians* (trans., New York, 1897); E. A. T. Wallis Budge, *The Gods of the Egyptians*, vol. ii (London, 1904). See Plate of EGYPTIAN DEITIES.

SETCH'ELL, WILLIAM ALBERT (1864–). An American botanist. He was born at Norwich, Conn., and was educated at Yale (A.B., 1887) and Harvard (Ph.D., 1890). He was an instructor at Yale in 1891–95 and at the Marine Biological Laboratory, Woods Hole, Mass., in 1890–95 and thenceforth served as professor of botany at the University of California. Besides contributions on the Algæ and kelps, Setchell published *Laboratory Practice for Beginners in Botany* (1897) and contributions to the University of California publications in botany.

SET'EBOS. The god worshiped by Sycorax and her son Caliban in Shakespeare's *Tempest*, a Patagonian deity described in the account of Magellan's voyage in Eden's *History of Travayle* (1577). Browning analyzes Caliban's attitude towards him in "Caliban upon Setebos."

SETH, ANDREW. See PRINGLE-PATTISON, ANDREW SETH.

SETH, JAMES (1860–). A Scottish philosopher, brother of Andrew Seth Pringle-Pattison, born in Edinburgh and educated there and at Leipzig, Jena, and Berlin. He was professor in Brown University (1892–96) and in Cornell University until 1898, when he was elected professor of moral philosophy at Edinburgh. He wrote *A Study of Ethical Principles* (1894; 12th ed., 1911) and *English Philosophers and Schools of Philosophy* (1912) and with Calderwood revised Fleming's *Vocabulary of Philosophy*.

SETH'ITES. The name given to an obscure Gnostic sect of the second century allied to the Ophites (q.v.); they belonged to that class of religionists who approached paganism. They maintained that Seth, the first son of Adam after the expulsion from Eden, had been the ancestor of all the Old Testament saints and their own progenitor and in the person of Jesus had again appeared in the world miraculously to help his followers. They had a book bearing the name of Seth. See GNOSTICISM.

SETI, sā'tê (Gk. *Σέθως, Sethōs*, Egypt. *Setoy*). The name of two Egyptian kings of the nineteenth dynasty.—SETI I, the second King of this dynasty, was the son and successor of Rameses I (q.v.) and reigned for some 10 years from about 1350 B.C. (Breasted puts the beginning of his reign 1313 B.C.) In the first year of his reign he made an effort to recover some of the Syrian possessions of Egypt lost during the internal dissensions which marked the close of the eighteenth dynasty. He marched as far as the northern border of Palestine, ravaging and plundering as he went. Here, however, his progress seems to have been effectually checked. On his return to Egypt he proceeded in triumph up the Nile and later recorded his exploits on the walls of the great temple of Karnak. Later in his reign Seti successfully defended his western frontier against the Libyans. This campaign was followed by an invasion of Galilee and a war against the Hittites. Among the many buildings erected by this monarch the most important are the Memnonium (q.v.) at Abydos, the memorial temple at Kurnah (q.v.) and the great hypostyle hall at Karnak (q.v.), which was completed by his son Rameses II. Seti's magnificent tomb in the Valley of the Kings, near Thebes, was discovered in 1817 by Belzoni and is commonly called Belzoni's tomb. It is nearly 350 feet long and consists of a number of halls, corridors, and chambers hewn out of the solid rock. The mummy of the King was found in 1881 at Deir el Bahri.—SETI II, the son of Meneptah (q.v.), was the fourth and last King of the nineteenth dynasty. He built a

small temple at Karnak. His mummy was found in 1898 in the tomb of Amenophis II. Consult: Wiedemann, *Aegyptische Geschichte* (Gotha, 1884–88); Budge, *A History of Egypt* (New York, 1902); Müller, *Die alten Aegypter als Krieger und Eroberer in Asien* (Leipzig, 1903); J. H. Breasted, *Ancient Records of Egypt*, vol. iii (Chicago, 1906); id., *A History of the Ancient Egyptians* (New York, 1908).

SETO, sā'tō. A small village on the island of Hondo, Japan, situated about 15 miles from Nagoya. It is noted for its manufactures of porcelain, which are among the finest produced in Japan and are known, like all similar Japanese pottery, as Seto ware.

SET-OFF. A claim due from a plaintiff to a defendant in an action, which the latter is allowed to interpose as total or partial defense to the plaintiff's demands. This originated in equity practice and was not known to common-law courts until the Statute of 2 Geo. II, c. 22, which provided that a defendant might reduce or defeat a plaintiff's demands by proving a just claim in his own favor. The right of set-off in equity was not affected by the above statute nor by similar legislation in the United States.

The law authorizing a set-off to be pleaded is permissive, not mandatory, and it is, therefore, optional with a defendant as to whether he will exercise the right or reserve his claim for separate action. A set-off is permitted only in actions arising out of contracts and is limited to liquidated demands or those easily reduced to a certain amount by computation. Therefore a claim in tort, as for malicious prosecution, cannot be a set-off in an action, as it is unliquidated, and the amount of damages must rest with a jury. At common law a set-off must be based upon a distinct claim. In most jurisdictions the claims must be mutual in order to allow a set-off, i.e., they must be confined solely to original parties. In some States a claim existing in favor of defendant and another against the plaintiff may be a set-off against the latter's claims to the extent of defendant's interest, but an affirmative judgment cannot be obtained. The facts constituting defendant's claim to a set-off must be specially pleaded with as much clearness as if they were the basis of an independent action.

Under modern codes the right of set-off and that of counterclaim are treated together and a single set of rules provided. Consult Barbour, *Law of Set-off* (Albany, 1841), and Waterman, *Law of Recoupment, Set-off, and Counter-claim* (New York, 1872). See PLEADING.

SE'TON, ELIZABETH ANN (1774–1821). The founder of the Sisters of Charity in the United States. She was the daughter of Richard Bayley and was born in New York City. She married William Seton (1794), accompanied him to Italy in 1803, and on his death at Pisa returned to New York and became a Roman Catholic in 1805. In 1808 she established at Emmitsburg, Md., the first house of what afterward grew to a widespread community. (See BROTHERS AND SISTERS OF CHARITY.) She was elected the first superior of the order and held that office until her death at Emmitsburg. Consult her autobiography (Elizabethtown, N. J., 1817); her memoirs, letters, and papers, edited by her grandson, Mgr. Robert Seton (q.v.) (2 vols., New York, 1869); C. I. White, *Life of Mrs. Eliza A. Seton* (10th ed., ib., 1904); A. Sadlier, *Elizabeth Seton* (ib., 1905).

SETON, ERNEST THOMPSON (1860–). An American author and illustrator, born at South Shields, England. He was educated at Toronto Collegiate Institute and at the Royal Academy, London, England, and in 1891 served as naturalist to the government of Manitoba. He became widely known through clever stories about animals, the author's name appearing for a time as Ernest Seton Thompson. His method was sharply criticized by such veteran naturalists as John Burroughs (q.v.) and by experienced woodsmen, who said that Seton ascribed to animals mental and moral characteristics not evinced in real life. He became known also as one of the originators of the Boy Scout movement; after three years, in 1901, several clubs had been formed, under the name of Woodcraft Indians. In 1904 the organization was introduced in England with the aid of General Baden-Powell (q.v.), and in 1908 the movement became popular under its new name of Boy Scouts (q.v.). Disaffected, Seton resigned as chief scout of the American Boy Scouts in 1915 and turned his attention to the Woodcraft League. Among his writings, largely illustrated by himself, are: *Wild Animals I have Known* (1898); *The Trail of the Sandhill Stag* (1899); *Lobo, Rag, and Vixen* (1899); *The Biography of a Grizzly* (1900); *Lives of the Hunted* (1900); *Two Little Savages* (1903); *Monarch, the Big Bear of Tallac* (1904); *Animal Heroes* (1905); *Woodmyth and Fable* (1905); *Life-Histories of Northern Animals* (2 vols., 1909); *The Biography of a Silver Fox* (1909); *The Boy Scouts of America: A Handbook* (1910); *The Arctic Prairies* (1911); *Woodcraft and Indian Lore* (1912); *Wild Animals at Home* (1913); *Manual of the Woodcraft Indians* (1915).

His wife, GRACE GALLATIN SETON (1872–), was born at Sacramento, Cal., studied in the Packer Collegiate Institute, Brooklyn, and in 1894 took up newspaper work in Paris. Two years later she married Mr. Seton. After 1897 she spent much time in designing book covers and title-pages. From 1898 to 1913 she was president of the Pen and Brush Club, New York. She is author of *A Woman Tenderfoot* (1900) and *Nimrod's Wife* (1907).

SETON, ROBERT (1839–). An American Roman Catholic prelate. He was born (of American parents) at Pisa, Italy, and was educated at first privately in the United States, carrying on his theological studies at Mount St. Mary's College and in Rome. He entered the priesthood and was made private chamberlain to the Pope in 1866 and prothonotary apostolic a year later. In 1903 he went to Rome and was named titular Archbishop of Heliopolis. For a time he was Roman correspondent of the New York *Times* under the signature Fyvie. He published a memoir (1869) of his grandmother, Elizabeth Ann Seton (q.v.); *Essays on Various Subjects, Chiefly Roman* (1882); *An Old Family* (1899).

SETON HALL COLLEGE. A Roman Catholic institution founded at Madison, N. J., in 1856 and removed to its present location in South Orange in 1860. The courses are classical and scientific and lead to the degrees of A.B. and S.B. There are high and grammar school preparatory departments. The college has (1915–16) 290 students with 20 instructors and a library of 40,000 volumes. The college property embraces about 70 acres. The income in 1915 was $91,000. The president in 1916 was Rt. Rev. J. F. Mooney, D.D.

SETON-KARR, Sir Henry (1853–1914). A British sportsman, born in India. He was educated at Harrow and at Corpus Christi College, Oxford (M.A.), and became a barrister in 1879. Interested in all kinds of sport, he traveled and shot big game in the western United States, British Columbia, and Norway and made a fine collection of American and Norwegian sporting trophies. From 1885 to 1906 Seton-Karr was a Conservative member of Parliament for St. Helen's, Lancashire, and he contested Berwicks in 1910. He was knighted in 1902. Besides various sporting articles and reviews he was author of *The Call to Arms* (1900–01) and *My Sporting Holidays* (1904).

SETTEMBRINI, sĕt'tĕm-brē'nē, Luigi (1813–76). An Italian littérateur and patriot, born in Naples. He took an active part in the agitations of the Two Sicilies, was imprisoned from 1839 to 1842, fled the country in 1848, was arrested again and condemned to death in 1849. In prison till 1858, he escaped his guards while being deported to Argentina and went to England. Of his early work the *Protesta del popolo delle due Sicilie* was inspired by D'Azeglio's work on Romagna, and his *Ricordanze* imitate and rival Pellico's *Prisons.* His principal work, *Lezioni di letteratura italiana,* lectures delivered at Naples (1867–76), reflects the passions and intellectual methods of the Italian liberation period, methods well described as Ghibelline from the insistence on the conflict of the laic and ecclesiastical powers as the principal source of Italian letters and art. Consult Colagrosso, *L. Settembrini* (Naples, 1884), and B. Croce, "L. Settembrini," in *La Critica* (Bari, 1913).

SETTER. A dog. See Field Dogs, and Plate of Dogs.

SETTIGNANO, sĕt'tē-nyä'nō, Desiderio da. See Desiderio da Settignano.

SET'TLE, Elkanah (1648–1724). An English playwright, born at Dunstable. In 1666 he entered Trinity College, Oxford, which he left without a degree, and went to London to seek a living by his pen. In 1671 his tragedy *Cambyses* was produced, and the Earl of Rochester and others, to annoy Dryden, proclaimed Settle the better dramatist. Through the influence of Rochester, Settle's next tragedy, *The Empress of Morocco,* was played by the lords and ladies of the court (1671). In this way a great run was secured for it when it was publicly produced (1673). Dryden was jealous of this success, and a war of pamphlets followed. In his satire, *Absalom and Achitophel* (1682), Dryden scourged him under the name of Doeg. Settle at once replied with *Absalom Senior* (1682). Settle soon relapsed into obscurity. Having the post of poet laureate for the city of London, he continued for a time, however, to compose pageants, and pieces for Bartholomew Fair. He died as a poor brother in the Charterhouse. Consult F. C. Brown, *Settle: Life and Works* (Chicago, 1910); W. F. Gray, *Poets Laureate of England: Their History and their Odes* (London, 1914).

SETTLED ESTATE (from AS. *sahtlian,* to reconcile). An estate which is less than absolute ownership and which is one of several estates created in the same property, all of which are governed as to duration and manner of enjoyment by one will or deed of settlement. The most common example is an estate given to a husband or wife for life by virtue of a marriage settlement. See Estate; Settlement.

SETTLEMENT. In the English law, a disposition of property whereby provisions are made for its successive enjoyment by designated persons for periods named in the will or deed effecting such disposal. Such provisions for successive enjoyment distinguish a settlement from other dispositions of property. A settlement is made to enable the person disposing of the property to govern the extent of its enjoyment and thereby to accomplish some purpose of his own, as to provide for a daughter after her marriage. Antenuptial marriage settlements are very common. Family settlements are frequently made when an eldest son attains his majority and provisions are made for the disposition of the father's or grandfather's estate among members of the family. In the United States settlements are not common, owing to the fact that in most States "married women's acts" secure to wives their separate estates, and family settlements are almost unknown. The term is also applied to the residence or right to support gained by a pauper by reason of birth in or living for a certain time in a parish or county, and to an agreement between two or more persons in reference to dealings or disputes between them, by which accounts are balanced or the controversy concluded.

SETTLEMENT, Act of. See Act of Settlement.

SETTLEMENTS, Social. See Social Settlements.

SETTLERS AND DEFENDERS OF AMERICA. An hereditary patriotic society incorporated in New York City in 1899. It admits to membership both men and women 18 years old or over and lineally descended (1) from a settler in one of the 13 original Colonies during the first 33 years of its colonization; (2) from an ancestor who, between May 13, 1697, and April 19, 1775, inclusive, rendered civil or military service in such Colony; (3) from an ancestor who, between April 19, 1775, and Sept. 13, 1783, inclusive, rendered actual service to the cause of American independence, either as a military or naval officer, soldier, seaman, privateer, militia or minute man, associator, signer of the Declaration of Independence, member of a Continental, Provincial, or Colonial Congress, or Colonial or State Legislature, or as otherwise a recognized patriot, who performed or actually counseled or abetted acts of resistance to the authority of Great Britain. No claim of eligibility through (1) or (2) is valid which does not also meet requirements of (3).

SETÚBAL, sā-tōō'bäl (formerly called in English *Saint Ubes* and *Saint Yves*). An important seaport of Portugal, in the District of Lisbon, on the north shore of the Bay of Setúbal, 18 miles southeast of Lisbon (Map: Portugal, A 3). It is the third city in the Republic in size and commercial importance. The harbor, defended by several forts and provided with broad and handsome quays, is second only to that of Lisbon. The chief exports are wine, fruit, salt, and corks. Setúbal was the birthplace of the poet Bocage (q.v.). Pop., 1900, 21,819; 1911, 30,436.

SEUBERT, zoi'bĕrt, Karl (1851–). A German chemist, born in Karlsruhe, Baden. After graduating from the Karlsruhe Technical School he taught there one year and then in the universities of Breslau and Tübingen, receiving the degree of Ph.D. from the latter in 1878. From 1895 he was professor of inorganic chemistry in the Technical School in Hanover. Be-

sides publishing many papers on chemical subjects he translated into German Remsen's *Textbook of Inorganic Chemistry* and *Introduction to Chemistry*.

SEUME, zoi'me, JOHANN GOTTFRIED (1763–1810). A German author, born at Poserna, near Weissenfels, Prussian Saxony. He was kidnaped by Hessian recruiting officers and sold to England to serve against the American Colonies. On his return from Canada he fell again into the hands of the military authorities, but with difficulty finally obtained his liberty and settled at Leipzig. In 1792 he went to Warsaw, where he acted as secretary to General Igelström and experienced the terrors of the Polish insurrection of 1794. He undertook a pedestrian tour of nine months' duration, from December, 1801, through Austria and Italy to Sicily and back through Switzerland and via Paris to Leipzig, which he described in his well-known *Spaziergang nach Syrakus* (1803; new ed., 1868; Reclam No. 186 et seq.). In 1805 he made a similar trip to Russia, Finland, and Sweden, commemorated in *Mein Sommer im Jahre 1805* (1807), which gives a vivid picture of the Napoleonic era. He died at Teplitz while taking a water cure. His works are characterized by a virile style and some biting satire. His autobiography, *Mein Leben*, was completed by Clodius (1813). A 10-volume edition of his *Sämtliche Werke* appeared in Hempel's *Nationalbibliothek* (Berlin, 1879). Consult Reissmann, *J. G. Seume* (Leipzig, 1898; new ed., 1904), and A. Sauer, *Reden und Aufsätze* (Vienna, 1903).

SEUSE, zoi'ze, HEINRICH. See SUSO, HEINRICH.

SEVANGA, syĕ-vän'gȧ. A lake of Transcaucasia. See GOKTCHA.

SEVASTOPOL. A seaport of Russia. See SEBASTOPOL.

SEVCIK, sĕv'tsĭk, OTTOKAR (1852–). A Bohemian violinist and teacher, born at Horaždowitz. He studied under A. Bennewitz at the Prague Conservatory (1866–70) and began his career as concert master of the Mozarteumskonzerte in Salzburg. His appearance as soloist in Vienna in 1873 resulted in an engagement for the Komische Oper. From 1875 to 1892 he was professor of violin at the music school of the Russian Imperial Music Society in Kiev, at the same time appearing frequently as soloist. In 1892 he became head of the violin department at the Prague Conservatory. The phenomenal success of some of his pupils (Kubelik, Kocian, Manén, Marie Hall) brought to him students from all parts of the world. His principles and method he published in several books, of which *Schule der Violintechnik* (4 parts, 1880) and *Schule der Bogentechnik* (6 parts, 1893) rank among the greatest works in musical pedagogical literature.

SEVEN (AS. *seofon*, connected with Lat. *septem*, Gk. ἑπτά, *hepta*, Skt. *saptan*, seven). A number regarded as sacred among many nations of antiquity, such as the Sumerians and Akkadians, the Assyrians, the Egyptians, the Medes, the Persians, the Indians, the Hebrews, the Greeks, and the Romans. The original reason for the preference of this number for sacred use seems to be astronomical, viz., observation of the phases of the moon, changing every seventh day, and of the Pleiades. These attracted attention before the sun, the moon, and the five planets, which are never seen at the same time, were grouped together, as in the Babylonian *zikkurats*, or temple towers. Sumerians and Akkadians spoke of seven evil spirits, especially powerful at the vernal equinox when the Pleiades were invisible. The penitent turned seven times to the right and seven times to the left. If his sins were seven times seven, yet they might be pardoned by Marduk. The number occurs frequently in the Babylonian story of the flood. (See DELUGE.) It was a sacred number among the Egyptians, and in harmony with this twice seven kine and twice seven ears of corn are shown in Pharaoh's dream. In the Hebrew scriptures God rests on the seventh day after six days of creative activity (see CREATION); every seventh day was a holy day (see SABBATH); every seventh year was a sabbatical year; and the seven times seventh year ushered in the year of jubilee. The three pilgrim festivals,—Passover, Feast of Weeks, and Tabernacles—lasted seven days, and between the first and second of these festivals seven weeks were counted. The first day of the seventh month was a holy convocation. The Levitical purifications lasted seven days, and the same space of time was allotted to the celebration of weddings and the mournings for the dead. The conception of seven heavens in later Judaism is likely to go back to a Babylonian idea. This is indeed affirmed in an oracle of Apollo cited by Porphyry (in Eusebius, *Præp. Ev.*, ix, 10), and the prototype is undoubtedly the seven *tubukati*, of which the seven-stepped *zikkurat* was an earthly copy. Later these were conceived of as concentric rings. The seven walls around Erech typified these. That seven was for similar reasons a sacred number among the Medes is seen from the seven walls around Ecbatana (Herodotus, i, 98). Ahura Mazda and the six Amesha spentas formed a heptad, which apparently gave rise to the Hebrew idea of the seven archangels. In the Apocalypse of John we have the churches, candlesticks, stars, trumpets, vials, spirits, all to the number of seven, as well as the seven horns, and the seven eyes of the Lamb. Among the Greeks the number seven was sacred to Apollo and Dionysus, who, according to Orphic legends, was torn into seven pieces; and it was particularly sacred in Eubœa, where it pervaded, as it were, every religious, private, or domestic relation. The Pythagoreans made much of this number. In different fields the seven sacraments, the seven free arts, the seven sleepers, and the seven wise men show the importance attached to it. Consult: P. Jensen, *Kosmologie der Babylonier* (Strassburg, 1890); H. Zimmern, in Schrader, *Die Keilinschriften und das Alte Testament* (3d ed., Berlin, 1912); Hugo Gressmann, "Zahlen," in *Die Religion in Geschichte und Gegenwart* (Tübingen, 1913).

SEVEN AGAINST THEBES, THE. A tragedy by Æschylus produced in 467 B.C. with the *Laius* and *Œdipus*. Its theme is the fulfillment of the curse pronounced by Œdipus on his sons Eteocles and Polynices. In the attack on the city the brothers find themselves opposed, and each falls by the hand of the other. At the close of the play Antigone declares her intention of burying her brother Polynices in spite of the prohibition, and the scene paves the way for the *Antigone* of Sophocles.

SEVEN CHURCHES OF ASIA. See CHURCHES OF ASIA, THE SEVEN.

SEVEN DAYS' BATTLES. A series of battles fought June 25–July 1, 1862, during the Peninsular campaign of the Civil War in Amer-

ica, between the Federal Army of the Potomac under General McClellan and the Confederate Army of Northern Virginia under General Lee. The principal engagements during this period were those of Mechanicsville (June 26), Gaines's Mill (June 27), Savage's Station (June 29), Frazier's Farm (June 30), and Malvern Hill (July 1). See articles on the various battles.

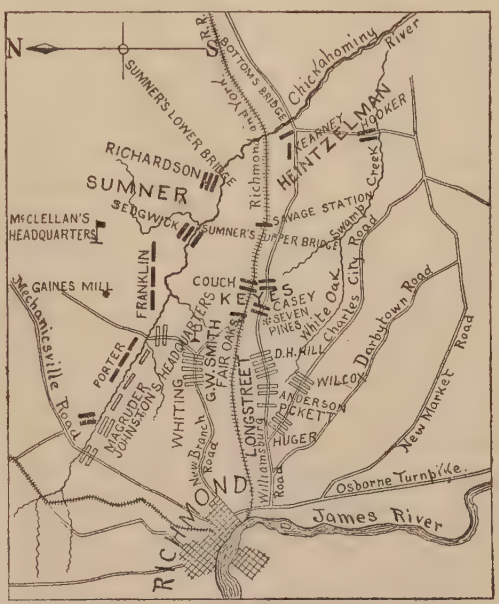
SEVEN DIALS. A locality in St. Giles, London, between Trafalgar Square and the British Museum, formerly noted as the resort of criminal and degraded classes and frequently appearing in the books of Dickens. A clock pillar with seven dial faces formerly stood there.

SEVEN GODS OF HAPPINESS (Sinico-Jap. *Shichi-fuku-jin*). A group of divinities, forming a popular appendage to Japanese Buddhism, of especial interest to the student of art. They are Fukurokujin, the god of longevity or wisdom, with an amazingly high forehead; Daikoku, with a mallet in hand and seated on bags of rice, the patron of worldly prosperity; Ebisu, a fisherman, who provides for the daily sustenance; Hōtéi, the Monk of the Hempen Bag; Bishamon, the warrior or god of martial prowess; Benten, the goddess who governs matrimonial affairs; while Jurojin lends aid to the aspirants after scholastic renown. Consult Anderson, *Descriptive and Historical Catalogue of Japanese and Chinese Paintings in the British Museum* (London, 1886).

SEVEN LAMPS OF ARCHITECTURE, THE. A treatise on architecture by John Ruskin (1849), showing its significance as a record of national life and belief.

SEVEN LIBERAL ARTS. See ARTS, LIBERAL.

SEVEN PINES, BATTLE OF, also known as the **BATTLE OF FAIR OAKS.** A battle fought about 7 miles east of Richmond, Va., May 31 and June 1, 1862, during McClellan's Peninsular campaign, between a part of the Federal Army of the Potomac, about 42,000 effective men (actually engaged) under General McClellan, and an equal Confederate force (part of what was later known as the Army of Northern Virginia) under Generals Joseph E. Johnston and G. W. Smith. It takes its name from a tavern, known as Seven Pines, on the field of battle and from the Fair Oaks station on the Richmond and York River Railroad. After the engagement at Williamsburg (q.v.) Johnston slowly withdrew towards Richmond south of the Chickahominy, and McClellan followed with deliberation. At the end of May McClellan sent first the Third Corps and then the Fourth Corps of his army, under Keyes and Heintzelman respectively, the latter the ranking officer, to the south side of the Chickahominy, retaining on the north side, for the purpose of coöperating, if necessary, with McDowell's army, then expected as a reënforcement, and of protecting the base of supplies at White House, the Second, Fifth, and Sixth Corps under the command of Sumner, Fitz John Porter, and Franklin. Johnston saw the weakness of McClellan's disposition of Federal troops and decided to attack in force the two corps, themselves widely separated, on the south side of the river, hoping to destroy them before reenforcements could arrive from Sumner, Porter, or Franklin. He planned the attack for May 31 and provided for the concentration at Seven Pines, by the Nine Mile, Williamsburg, and Charles City roads, of a force greatly superior to the Federals, for the defeat first of Keyes and then of Heintzelman. The positions of the opposing forces on the morning of the 31st are shown in the map. Late on May 30 a violent rainstorm occurred, and the Chickahominy became too swollen for safe crossing of Federal reënforcements. Owing to a misunderstanding of Johnston's orders by Longstreet, who was charged with opening the battle, the attack was not delivered until after 1 P.M., but before dark Keyes, though reënforced by Kearny's division of Heintzelman's corps, had been driven back to



SEVEN PINES.

a point 1½ miles east of Seven Pines. Part of Keyes's troops, however, under Couch, were driven to Fair Oaks, whence they fell back towards Sumner's bridges across the Chickahominy. At 2.30 P.M., under orders from McClellan, Sumner crossed the river with a division under Sedgwick and a battery under Kirby, at what later became known as Sumner's Upper Bridge, and at about 5 o'clock, after delays by rough and muddy roads, reached Fair Oaks station in time to intercept and force back Whiting's division (from the Confederate left, where G. W. Smith was in command), then on its way to reënforce Longstreet. Here some of the most stubborn fighting of the day occurred, and about 7 P.M. Johnston was severely wounded, whereupon General Smith took command of the Confederate army. Early on the following day Longstreet again attacked the Federal left, which had been reënforced over Sumner's Lower Bridge, by Richardson's division of Sumner's corps, but he was repulsed and forced back. At 2 o'clock in the afternoon Gen. R. E. Lee, just arrived on the field of battle, superseded Smith in command of the Confederates, and on the night of the 2d the army was withdrawn to the neighborhood of Richmond. McClellan did not appear on the field of battle until about noon on the 1st. The loss of the Federals in killed, wounded, and missing was about 5000, that of the Confederates somewhat more than 6000.

Bibliography. A. S. Webb, *The Peninsula: McClellan's Campaign of 1862* (New York, 1881);

G. B. McClellan, *McClellan's own Story* (ib., 1887); Johnson and Buel (eds.), *Battles and Leaders of the Civil War* (ib., 1887); J. C. Ropes, *Story of the Civil War*, vol. ii (ib., 1898); P. S. Michie, *General McClellan*, in the "Great Commanders Series" (ib., 1901); James Longstreet, *From Manassas to Appomattox* (2d ed., Philadelphia, 1903); E. P. Alexander, *Military Memoirs of a Confederate* (New York, 1907); Steele, *American Campaigns* (Washington, 1909).

SEVEN SAGES, The. Greek sages who lived between 620 and 550 B.C. They were rulers, lawgivers, or counselors, distinguished for practical wisdom and believed to be the authors of brief aphorisms expressing the results of their moral and social experiences. The ancients were not agreed with regard to the names, the number, or the sayings of the sages. The number seven is as old as Pindar, but the earliest list of the seven is given in Plato's *Protagoras* (343). Those usually included in the number are Solon, the famous lawgiver of Athens; Thales of Miletus, the philosopher; Pittacus of Mitylene, the deliverer and magistrate of his native city; Bias of Priene; Chilon of Sparta; Cleobulus, tyrant of Lindus; and Periander, tyrant of Corinth. The sayings attributed to them were first collected by Demetrius of Phalerum; some have been preserved to us by Stobæus (q.v.) (*Floril.*, 3, 79). Consult: F. Mullach, *Fragmenta Philosophorum Græcorum*, vol. i (1860); Bohren, *De Septem Sapientibus* (Bonn, 1867); Wulf, *De Fabellis cum Collegii Septem Sapientium Memoria Conjunctis Quæstiones Criticæ* (Halle, 1896). A Greek collection of these aphorisms in iambics was published by Wölfflin in the *Proceedings* of the Bavarian Academy (1886), and there are two Latin collections by Brunco (Bayreuth, 1885).

SEVEN SLEEPERS, The. The heroes of a celebrated legend, which exists in several Syriac versions, the earliest that of Jacob of Sarug (451–521). In the Latin version by Gregory of Tours they were seven Christians (brothers) of Ephesus, who, during the persecution of Decius in 250, took refuge in a cave. Their retreat was discovered and the entrance walled up. By a miracle, however, they fell into a prolonged sleep. Two hundred years later the cave was accidentally opened, and the sleepers awoke. They supposed they had slept but a night, and when one of their number went to the city stealthily to purchase provisions, he was amazed to find his coin no longer current, and the Christian religion accepted by all. The wonderful history known, the sleepers were conducted in triumphant procession into the city, but they all died at the same moment. They are honored as saints by the Western and Eastern churches; in the former their day is July 27, in the Greek church August 2 or 4, and with the Maronites March 7. Their story is also found in the Koran (xviii, 8–24). Consult Baring-Gould, *Curious Myths of the Middle Ages* (London, 1881), and Koch, *Die Siebenschläferlegende* (Leipzig, 1883).

SEVENTEEN-YEAR LOCUST. See CICADA.

SEVENTH. See INTERVAL.

SEVENTH-DAY ADVENTISTS. See ADVENTISTS.

SEVENTH-DAY BAPTISTS. See BAPTISTS, *Baptists, Seventh-Day*.

SEVEN WEEKS' WAR. The name given to the brief war in 1866 between Prussia and Italy on the one side and Austria and her German allies (Bavaria, Württemberg, Baden, Saxony, Hesse, Hesse-Cassel, Hanover, Nassau) on the other. The war was the culmination of Bismarck's plan for forcing Austria out of the German Confederation and making way for a new Germany under Prussian leadership. For an account of the preliminary events leading to the struggle, see BISMARCK; GERMANY; PRUSSIA; SCHLESWIG-HOLSTEIN.

On April 8, 1866, Prussia had concluded a secret alliance with Italy, and the issue of a federal execution by the Diet against Prussia on June 14 was followed by the declaration of war against Austria, Saxony, Hanover, and Hesse-Cassel. Invasion of Bohemia was immediately begun. The central (First) Prussian army, under Prince Frederick Charles (q.v.), entered from eastern Saxony, crossing the frontier range of the Erzgebirge towards Reichenberg; the western or Elbe (Third) army, under Gen. Herwarth von Bittenfeld, started from Dresden and entered Bohemia by Neustadt and Schluckenau; while the eastern or Silesian (Second) army, under the Crown Prince Frederick William (later the German Emperor Frederick III) (q.v.), entered Bohemia from Silesia by the Trautenau and Nachod passes. As the Austrians expected the attack from Silesia, most of their army was stationed behind the Riesengebirge; so that when Von Bittenfeld and Prince Frederick Charles crossed the Erzgebirge (June 24), they found themselves opposed by only the outlying brigades of Clam-Gallas, which they forced to retire towards Turnau and Münchengrätz, after defeating them in small combats and in a severe struggle at Podol. The First Prussian Army and the Elbe Army, now united, advanced leisurely, driving the enemy before them towards Münchengrätz, where Clam-Gallas was attacked on June 28 and, after a brief but severe contest, forced to retreat in haste. By several routes the combined armies went on, routing detached corps of Austrians and Saxons, and after a severe contest (June 29) took Gitschin and joined the Crown Prince. Clam-Gallas retired to join the main body under Benedek.

The army of the Crown Prince advanced in two divisions, the right wing by Landshut, towards Trautenau; the left by Glatz, towards Nachod and Skalitz; while the centre entered Bohemia by Braunau, all crossing the frontier on June 26 and 27. The passes were traversed without opposition, but the Austrian forces under Gablenz opposed a determined resistance when the invaders emerged. Both sides were strongly reenforced, but victory remained with the Prussians in encounters at Nachod, Skalitz, and Schweinschädel. The three Prussian columns, having a firm lodgment in Bohemia, moved steadily forward in lines converging to a point north of the Austrian army, then concentrated between Josephstadt and Königgrätz; and King William I of Prussia, who had arrived (July 2) at the headquarters of the First and Third armies, hearing of Benedek's intention of attacking before the Crown Prince's army could come up, resolved to anticipate him and ordered an attack on the Austrian position at 8 A.M. on July 3, at the same time sending an urgent message to hasten his arrival. (See SADOWA, BATTLE OF.) The Austrians and Saxons were utterly routed and only saved from annihilation by their cavalry. All hope ended of staying the advance of the Prussians with the army of Benedek; a truce was asked, but refused; and the Prussians pushed forward towards Vienna,

whither Benedek had drawn his beaten forces. At the same time the southern Austrian army, hitherto employed against the Italians, was summoned to the defense of Vienna, when, through the agency of the Emperor of the French, a truce was declared (July 26), at Nikolsburg, which afterward led to a treaty of peace.

Just before this campaign began the Italians, who had entered into an alliance with Prussia in order to secure the liberation of Venetia, assembled an army of 200,000 men, one-half of which, under General La Marmora (q.v.), was to cross the Mincio between Peschiera and Mantua, while the other half was at Bologna to operate on the lower Po. To oppose this force the Archduke Albert, commander in chief of the Austrian forces in Italy, had about 90,000 men near Verona, besides the garrisons of the Quadrilateral and Venice, which were not available for field service. On June 23 La Marmora's army crossed the Mincio, unopposed by the Austrians. The Archduke, however, succeeded in drawing his opponent into an unfavorable position and attacked him (June 24) at Custozza with his whole force. The Austrians achieved a decisive victory. The Italians fell back towards the Mincio, unpursued by their exhausted opponents.

While the Italian generals were deliberating on the renewal of the campaign, news came of the great defeat which the Austrians had sustained in the north and of the cession of Venetia, by the Emperor of Austria, to the Emperor Napoleon. On July 20 the Italian fleet, under Persano, suffered a great defeat at Lissa by the Austrian Admiral Tegetthoff.

In spite of her disasters Italy was loath to agree to the armistice signed by the two belligerent German Powers at Nikolsburg on July 26 and attempted to insist upon the Trentino's surrender by Austria. Prussia would not support this demand, and Victor Emmanuel gave way reluctantly, agreeing to the armistice August 12. The Peace of Prague was signed August 23.

A third contest was, about the same time, in progress between Prussia and those states of Germany which had sided with Austria. The Hanoverian army was compelled to surrender at Langensalza, June 28. Operations against the forces of the South German states (Bavaria, Württemberg, Baden, and the Grand Duchy of Hesse) in the valley of the Main and in the Lower Franconia (Kissengen) were brought to a successful issue by Vogel von Falckenstein and other Prussian generals. For results of the war, see GERMANY; ITALY; PRUSSIA.

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SEVEN WISE MASTERS. A collection of stories, probably of Oriental origin and of wide currency in Europe in the Middle Ages. Although the details vary, the general framework is as follows: A Roman emperor has his son by a former marriage reared by seven sages far from the court. When the Prince reaches manhood his father summons him home, but a period of danger for the youth is foretold by the stars. To avert the peril he is secretly bidden by his teachers to remain silent for seven days. During this time his stepmother accuses him before the King in revenge for his refusal to return her proffered love. The Prince is sentenced to die. His death is delayed, however, by the seven sages, each of whom tells a story to the King of the craft of women in refutation of the stories told by the Queen. This continues for seven days. At the end of this time the Prince breaks his silence and proves his innocence, whereupon the Queen is executed. An analogous collection occurs in the Sanskrit *Sukasaptati* (q.v.) and, with a different theme, in the *Vētālapañcavimśati* (q.v.). In the *Arabian Nights* there is also a parallel in the collection entitled *The Malice of Women* (nights 578–606). Originally the story was translated apparently from Sanskrit into Pahlavi, thence into Arabic, from which it came into Spanish, Hebrew, and Syriac, being translated from the latter language into Greek by Andreopulos under the title *Syntipas* (ed. by Boissonade, Paris, 1828). It reached the Occident apparently about the twelfth century. In 1184 or 1185 the monk Johannes de Alta Silva (the modern Haute-Seille, near Toul) made a version entitled *Dolopathos, sive Historia de Rege et Septem Sapientibus* (ed. by Oesterley, Strassburg, 1873). On this *Dolopathos* the *trouvère* Herbert based his poetic version, *Li Romans de Dolopathos*, in the thirteenth century (ed. by Brunet and Montaiglon, Paris, 1856), and closely related to this is the Old French *Roman des sept sages* (ed. by Keller, Tübingen, 1836), based on a Latin recension now lost. A third Latin version, the *Historia Septem Sapientium* (ed. from a manuscript of 1342 by Buchner, Erlangen, 1889), was the best known of all and served as a basis for numerous translations in German, Dutch, French, Spanish, and English, passing from English into Armenian, Bohemian, Polish, and Russian. From a fourth Latin text (ed. by Mussafia, Vienna, 1868) were derived two Italian versions (ed. by Romagnoli, Bologna, 1862, 1865). Consult: Gaston Paris, *Deux rédactions du roman des sept sages de Rome* (Paris, 1876); Petras, *Ueber die mittelenglischen Fassungen der Sage von den sieben weisen Meistern* (Grünberg, 1885); Murko, *Die Geschichte von den sieben weisen bei den Slaven* (Vienna, 1890); Teza, *Il libro dei sette savi nella letteratura armena* (Venice, 1905); Killis Campbell, *Study of the Romance of the Seven Sages with Special Reference to the Middle English Versions* (Baltimore, 1898); id., *Seven Sages of Rome* (ed. with glossary, Boston, 1907).

SEVEN WONDERS OF THE WORLD. A group of famous works of antiquity; mentioned in an epigram of Antipater of Sidon in the second century B.C. Antipater's list is: the walls of Babylon, the statue of Zeus by Phidias at Olympia, the hanging gardens at Babylon, the Colossus (q.v.) of Rhodes, the pyramids of Egypt, the mausoleum (q.v.) at Halicarnassus, and the temple of Artemis at Ephesus. (See DIANA, TEMPLE OF.) Another list combined the walls and hanging gardens under one head and added the Pharos (q.v.) of Alexandria.

SEVEN YEARS' WAR (1756–63). Primarily a continuation of the contest between Frederick the Great of Prussia and Maria Theresa of

Austria for possession of Silesia, this war became world important, as France and England here fought for supremacy in North America and in India. All the great European nations were involved. Frederick William I of Prussia learned before his death in 1740 how fruitless was the traditional Hohenzollern loyalty to the house of Hapsburg. His son, Frederick the Great, adopted a new policy of self-assertion for Prussia. In the first and second Silesian wars (1740–42 and 1744–45), forming part of the great European struggle known as the War of the Austrian Succession (see SUCCESSION WARS), he won Silesia, upon which the Hohenzollerns had an old claim. His title to its possession was recognized in the Treaty of Aix-la-Chapelle (1748). Maria Theresa was bent upon recovering Silesia, and France and England were still at odds. In 1754 the French and Indian War (q.v.) broke out in America, and in the spring of 1756 England and France were fighting in the Mediterranean. In preparation for a struggle a new alignment of European alliances had formed. Austria, whose foreign policy was directed by Kaunitz (q.v.), and France, whose King, Louis XV, was under the sway of Madame de Pompadour, had dropped the policy of antagonism they had maintained for two centuries and concluded a treaty of alliance at Versailles, May 1, 1756. Ten years before a defensive alliance against Frederick had been arranged between Austria and Russia. Great Britain in case of a European war had common interest with Prussia, for Hanover would be exposed to attacks by her old enemy, France. She therefore entered into an alliance with Prussia. On April 22, 1756, Russia proposed to Austria the partition of the Prussian territories. Frederick, well informed of his enemies' plans, anticipated their actions and, after a demand on the two Powers as to their intentions, on Aug. 29, 1756, invaded Saxony, which he knew to be friendly to Austria.

Frederick threw a column into Bohemia and met the Austrian advance under Browne in an indecisive battle at Lobositz, October 1. The Saxon army, after a siege of some weeks at Pirna, capitulated on October 16, and thereafter Saxony was used by Frederick as a base of operations, and her revenues collected by Prussia. On Jan. 17, 1757, the Diet of the German Empire declared war on Prussia, and in February Austria, Russia, and France completed a new treaty of offensive alliance. Sweden also joined them. The English alliance promised little for Prussia, and it was not until Pitt (q.v.) was established in control of British foreign affairs that it promised utility for Frederick. The coalition against Frederick, whose subjects numbered only about 5,000,000, was the most powerful that Europe had ever witnessed. Surrounded by such foes, the Prussian King's policy was to concentrate attacks and strike heavy blows. He made his first attack in Bohemia, defeated the Austrians under Charles of Lorraine and Browne before Prague, May 6, in a desperate battle, laid siege to Prague, but lost at Kolin against the Austrian Marshal Daun (q.v.), June 18. This compelled the King to retire into Saxony. Meanwhile the French had taken much of north Germany west of the Elbe, which was defended by an insufficient English and Hanoverian force under the incompetent Duke of Cumberland. The latter retreated before the French, was beaten at Hastenbeck, July 26, and signed the disgraceful Convention of Kloster-Zeven, September 8, in accordance with which the Hanoverian army was to be dispersed and Hanover left to the French. This was a virtual surrender, and the English government repudiated it. Frederick turned next against the French and Imperialists, under the command of Soubise (q.v.), and at Rossbach (q.v.) won a most brilliant victory, Nov. 5, 1757. A month later he inflicted a great defeat upon the Austrians under Daun at Leuthen, December 5; this was followed by the surrender of Breslau and Liegnitz. Meanwhile in East Prussia the Prussians under Lehwaldt were defeated at Gross-Jagerndorf by the Russians under Apraxin, August 30, and East Prussia was overrun. But Pitt had now taken firm hold of English affairs and entered into full coöperation with Prussia. Ferdinand of Brunswick was placed in command of the Hanoverians and Frederick's resources increased by a liberal grant from England.

In 1758 Frederick opened another year of aggressive campaigning. He recaptured Schweidnitz in Silesia, besieged Olmütz unsuccessfully, then turned upon the Russians (now in Brandenburg) and defeated them at Zorndorf, August 25. Marching into Saxony, he was attacked by Daun at Hochkirch, October 14, and defeated, though not badly. He then passed around Daun's army and relieved Upper Silesia, in danger of occupation by the Austrians. Prussia was now almost exhausted. Hemmed in by the Russians and Austrians under Soltikoff and Laudon, Frederick met his worst defeat at Kunersdorf (q.v.), near Frankfort-on-the-Oder, Aug. 12, 1759, where almost his entire army was destroyed or dispersed. On November 21 his general, Finck, was trapped at Maxen in Saxony and compelled to surrender with about 13,000 men. Prussia now seemed prostrate. In the west, however, conditions had changed with the change in commanders. Ferdinand of Brunswick signally defeated the French at Crefeld, June 23, 1758, and at Minden, Aug. 1, 1759. The victory of Minden, with the success of the English against the French in Canada, where they took Quebec, the capture of Guadeloupe, and the naval victory of Admiral Hawke over the French in Quiberon Bay, November 20, redeemed the year 1759 for the Anglo-Prussian alliance.

After 1759 Frederick fought on the defensive. In 1760 the Prussians were defeated at Landshut, June 23, and lost Glatz, July 26. Frederick won by hard fighting the battles of Liegnitz, August 15, over Laudon, and Torgau, November 3, over Daun, but in October Berlin itself had been raided by Russians and Austrians. In 1760 George III succeeded to the English throne, and in 1761 Pitt went out of office. With Pitt went England's grand designs. The government failed to renew the convention with Prussia, which thus lost her one ally. Frederick never forgave this. The death of the Empress Elizabeth of Russia, Jan. 5, 1762, and the accession of Peter III, Frederick's ardent admirer, coming at this critical juncture, saved Prussia. The new Czar made an alliance with Frederick, and the Russian arms were turned against Austria. Frederick was able to take the initiative again and defeated the Austrians at Burkersdorf in Silesia, July 21, 1762, and on August 16 defeated Daun at Reichenbach. On October 29 Prince Henry, brother of Frederick, and Seydlitz were victorious at Freiberg. Peter was deposed July 9 by his wife, Catharine II, and the Russian troops were ordered home. Sweden also with-

drew. Late in 1762 a truce was concluded between Austria and Prussia, both sides being exhausted.

France had drawn Spain into the struggle with England by the Bourbon family compact of Aug. 5, 1761, which Choiseul had negotiated, and Bute, who had sought peace at any price, was obliged to follow the course marked out by Pitt. In 1762 Martinique, Havana, and Manila fell into the hands of the English. The struggle in India was already decided in favor of England. On Nov. 3, 1762, preliminaries of peace were signed at Fontainebleau between England, France, Spain, and Portugal (which had been attacked by the Bourbon coalition), and the definitive Peace of Paris was arranged on Feb. 10, 1763. (See PARIS, TREATIES OF.) Austria and Prussia concluded the Peace of Hubertsburg on Feb. 15, 1763. As Prussia retained Silesia, the war brought no changes territorially in Europe, but it placed Prussia among the Powers of the first rank. Outside of Europe it changed the aspect of the world, bringing about the downfall of France as a colonial Power and preparing the way for the British Empire in India.

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SEVERIN, TURN-. See TURN-SEVERIN.

SEV'ERI'NUS, SAINT (c.400–482). A missionary of Latin birth, born either in northern Africa or southern Italy, often known as the Apostle of Noricum. In 454, after the death of Attila, he went among the Norici to establish the only partially recognized religion of Christianity. Consult *Life of Severinus by Eugippius, Translated into English for the First Time*, with notes by G. W. Robinson (Cambridge, Mass., 1914).

SEV'ERN. One of the principal rivers of England. It rises on Plinlimmon in Montgomeryshire, Wales, flows first easterly, crosses Shropshire in an easterly and southeasterly direction, and flows southward through Worcester and Gloucester, forming a large estuary, which widens into the Bristol Channel (q.v.) (Map: England, D 5). It is 210 miles long and navigable for vessels drawing 6 feet as far as Stourport and for barges to Welshpool, 180 miles from its mouth. The chief affluents of the Severn are the Avon on the east and the Wye on the west. A canal, 18½ miles long, navigable for vessels of 350 tons, shortens the route from the upper portion of the estuary to Gloucester. Canals connect the Severn with the Thames, Trent, and Mersey. A tunnel under the estuary, over 4 miles long, connects Bristol with south Wales.

SEVERO (sā-vā'rō) **CAPE,** NORTHEAST CAPE, or CAPE CHELYUSKIN. The northernmost point of the Asiatic continent (Map: Asia, M 1). It is a portion of the tundra extending northward from the Taimyr Peninsula to lat. 77° 34′ N. After its discovery by the Russian officer Chelyuskin in 1742 it was not again visited until Nordenskiöld reached it in 1878.

SEVERSK. See NOVGOROD-SEVERSK.

SEVE'RUS, ALEXANDER. See ALEXANDER SEVERUS.

SEVERUS, GAIUS CASSIUS. See CASSIUS PARMENSIS.

SEVERUS, LUCIUS SEPTIMIUS (146–211 A.D.). A Roman, Emperor from 193 to 211, born near Leptis Magna, on the north coast of Africa. He was commander of a legion in Gaul and governor successively of Gallia Lugdunensis, Pannonia, and Sicily. After the murder of Pertinax (q.v.) he was proclaimed Emperor, at Carnuntum, and promptly marched upon Rome. His arrival before the city was the death signal for Julianus. After taking vengeance on the murderers of Pertinax and distributing an extravagant largess to his soldiers, Severus conquered Pescennius Niger at Issus (194 A.D.). A campaign in the East and a three years' siege of Byzantium, which was finally taken, were followed by a desperate struggle with Clodius Albinus, whom he conquered in 197. Severus returned to Asia and won a most brilliant success in 198 against the Parthians and took and plundered their capital, Ctesiphon. He returned to Rome in 202 and exhibited shows of unparalleled magnificence and distributed another extravagant largess to the citizens and the prætorians. A rebellion in Britain drew him to that country in 208, and at the head of an immense army he marched, it is said, to the extreme north of the island, encountering hardships to which no less than 50,000 of his soldiers succumbed. To safeguard the natives of southern Britain from the incursions of the Meatæ and the Caledonians, Severus began the wall which bears his name. (See ROMAN WALL.) He died soon after at Eboracum (York). Consult: H. Schiller, *Geschichte der römischen Kaiserzeit* (Gotha, 1880–83); Fuchs, *Geschichte des Kaisers L. Septimius Severus* (Vienna, 1884); the article "Septimius, 13," in Friedrich Lübker, *Reallexikon des klassischen Altertums*, vol. ii (8th ed., Leipzig, 1914).

SEVERUS, WALL OF. See ROMAN WALL; SEVERUS, LUCIUS SEPTIMIUS.

SEVIER, sē-vēr', JOHN (1745–1815). An American pioneer and soldier, born in Rockingham Co., Va. In 1764 he founded the village of New Market in the Shenandoah valley, became celebrated as an Indian fighter, and in 1772 removed beyond the Alleghanies to the Watauga settlements. He served as captain in Lord Dunmore's War and was a delegate for several years to the North Carolina Legislature. Sevier conducted many expeditions against the Indians, gaining victories over them. In 1781 he fought under Marion and was made brigadier general. He was Governor of the "State of Franklin" in 1785–88, on the breaking up of which by North Carolina he was imprisoned, but soon escaped. In 1789 he was a member of the North Carolina Senate and in 1790 was a Representative to Congress. In 1793 he conducted the Etowah campaign against the Creek and Cherokee Indians

and in 1796 became the first Governor of Tennessee, serving until 1801. He was again Governor from 1803 to 1809, then served in the State Senate, and was a member of Congress from 1811 to 1815. He died on a mission to the Creek Indians. Consult Theodore Roosevelt, *Winning of the West* (new ed., 4 vols., New York, 1904).

SEVIER (sē-vēr′) **LAKE.** A salt lake lying among the Basin Ranges of western Utah and surrounded by the Sevier Desert (Map: Utah, A 3). It has no outlet, but is fed by the Sevier River. In 1872 the lake was about 28 miles long, its water surface measured 188 square miles, and its maximum depth was about 15 feet, but, since the river is now largely used for irrigation, the lake bottom is dry for a great part of the year and is covered with a vast deposit of salt.

SÉVIGNÉ, sā′vē′nyā′, MARIE DE RABUTIN-CHANTAL, MARQUISE DE (1626–96). A French epistolary writer. She was born in Paris, Feb. 6, 1626. Her uncle and guardian, Christophe de Coulanges, Abbé de Livry, gave his niece an excellent education; among her tutors were Chapelain and Ménage. Her earliest letters are in response to Ménage's professions of love. Among the close friends of her youth was the future Madame de la Fayette. The careful management of her guardian left her relatively rich at 18, when she married Henri, Marquis de Sévigné, a Breton gentleman, whom she loved better than he seems to have deserved. The Chevalier d'Albret mortally wounded him in a duel over Madame de Gondran, and he died in 1651. To her children Madame de Sévigné devoted the rest of her life, especially to the daughter, who did not worthily requite her affection.

Her social tact, good looks, vivacity, and charm made her very popular and brought her the homage of many distinguished friends, among them Turenne and the Prince de Conti. It was not till her daughter's marriage (1669) that her letters became numerous. Count de Grignan was practically Governor of Provence, and Madame de Sévigné divided her time between Paris, Les Rochers, and visits, not always welcome, to her daughter. From 1677 to 1678 Madame de Grignan was chiefly in Paris, and the correspondence lagged. It was afterward resumed in quite its early volume. Mother and daughter were together also at Paris from 1691 to 1694, but it was at Grignan that Madame de Sévigné died, April 17, 1696.

The letters of Madame de Sévigné are unrivaled for their fresh charm, shrewd wit, and easy gayety of heart. They form an almost complete and familiar chronicle of the court and high society of the time (1669–1695). Their vivacity scarcely ever flags, whether she is telling of court life, of scenes at the baths of Vichy, or of country society and diversions. She writes spontaneously, sketches vivid pictures in a few rapid strokes, or gives in sparkling narrative the social happenings of the day, meanwhile unwittingly revealing her own character. Madame de Sévigné enjoyed some literary fame during her lifetime. Her letters, as edited by Regnier and others (Paris, 1862–68; 2d ed., 1887 et seq.), fill, with some other correspondence, 14 volumes, of which the first contains a *Life*, and two others (vols. xiii, xiv) a lexicon. This is supplemented by Capmas, *Lettres inédites de madame de Sévigné* (Paris, 1876). There are many other editions complete and partial, the first in 1726, the most noteworthy, by Monmerqué, in 10 volumes (ib., 1818–19).

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SEVILLE, sĕv′ĭl *or* sē-vĭl′ (Sp. *Sevilla*, sā-vē′lyā). The capital of the province and of the former Kingdom of Seville, in Andalusia, Spain, situated on the left bank of the Guadalquivir, 58 miles north-northeast of Cadiz and 75 miles southwest of Cordova (Map: Spain, C 4). Although the city lies 60 miles from the mouth of the river, the tide ascends 12 miles above it. Large portions of it lie below the high-water level of the river, with the result that the city has frequently suffered from disastrous inundations. The climate is delightful, though the summers are very warm, a shade temperature of 116° F. having been recorded. The surrounding plain is exceedingly fertile and well cultivated. The city was formerly surrounded by a high wall, portions of which still remain. There is a wide and open strip of embankment along the river, and the latter is crossed by three bridges, one a railroad bridge, to the suburb of Triana.

The city itself is a labyrinth of narrow, winding streets and lanes; it still preserves its old Moorish aspect, and the Moorish style of construction is seen here more characteristically, perhaps, than in any other Spanish city. The houses are generally of two stories and inclose the arcaded *patio* in the centre. Large sections of the city, however, especially the northern and western parts, have straight and regular streets. The principal squares within the city are the Alameda de Hércules in the north, adorned with statues and several rows of trees; the Plaza de San Fernando, faced by the city hall; and the Plaza del Triunfo in the south, on which stand three of the most interesting buildings in the city, the cathedral, the Alcázar, and the Casa Lonja or exchange.

The cathedral of Seville is one of the largest and grandest Gothic structures in existence. It was begun in 1402 on the site of the old Moorish mosque which had formerly served as cathedral, and parts of which still remain as the Patio de los Naranjos, or Orange Court. It is 380 feet long (or, including the Chapel Royal, 442 feet) and 250 feet wide; the nave is 53 feet wide and 132 feet high. It was finished in 1517. It contains a wealth of art treasures. In 1882 restorations were begun, as the vaulting had been weakened by earthquakes. Adjacent to the cathedral and forming a part of the old mosque

SEVILLE

THE GIRALDA TOWER AND THE COURT OF ORANGES

stands the remarkable tower of La Giralda, perhaps the most beautiful building in the city. It is a square tower 330 feet high, the upper 100 feet being a belfry and dome added in the sixteenth century. The top is surmounted by a bronze statue of Faith, 13 feet high, which moves in the wind like a vane (*giralda*). The Alcázar was the palace of the Moorish kings and later of the Spanish sovereigns. It originally included the now isolated Torre de Oro, which stands on the river bank, and contains several beautiful *patios* almost rivaling those of the Alhambra. Other interesting buildings in the city are the Casa de Pilatos; the magnificent Moorish-Renaissance palace of the Duke of Medinaceli; the Palacio de Santelmo, situated among the parks near the river; the immense tobacco and cigar factory (Fábrica de Tabacos), covering more than 6 acres; the bull ring, which is the largest in Spain after that of Madrid and capable of seating 12,000 spectators.

The educational establishments include a university founded in 1502, with faculties of law, philosophy, and science, a medical faculty situated at Cadiz, and about 1100 students in 1913. There are also a provincial school of art, the Seminary of St. Francis Xavier, an institute for secondary education, a normal school, numerous minor academies, and the provincial library with 99,000 volumes. In the cathedral is installed the valuable Columbian Library of 42,000 volumes, formed by Fernando Colón, son of the discoverer, and including manuscripts of Columbus. The Indian archives, a collection of documents relating to the discoveries of the Indies, are installed in the Casa Lonja, and the city has also an interesting collection of municipal archives and a museum of archæology. The Museum of Paintings contains the largest and best collection of Murillo, who was born in Seville, and whose house is still to be seen there. A number of his works are also found in various churches of the city. Among the charitable establishments the most notable is the Hospital Civil or de las Cinco Llagos, one of the largest in Europe.

The commerce and industries are of considerable importance. The tobacco factory employs 6000 hands, and there are iron foundries and machine shops, and manufactures of chocolate, soap, perfumes, beverages, corks, silks, and musical instruments, including pianos. The suburb of Triana is noted for its manufactures of pottery, and the large convent of La Cartuja has since 1839 been used as a factory for ceramic products, employing 2000 hands and equipped with modern machinery. The chief exports are iron ore, lead, copper, mercury, and other minerals, oranges, olives and olive oil, cork, grain, and wine. Pop., 1900, 148,315; 1910, 158,287.

The Hispal of the Phœnicians, the Hispalis of the Romans, was corrupted by the Moors into Ishbilliah, from which the Spanish name of the city was derived. Seville was a place of great importance in the latter period of Roman dominion, became the capital of southern Spain during the ascendancy of the Vandals and the Goths, and was the scene of two notable Church councils (590 and 619). It fell into the hands of the Arabs in the eighth century, under whom it prospered greatly, its population reaching 400,000. In 1026 it became the capital of the Moorish Kingdom ruled by the Abadites (see ABAD), from whom it passed, in 1091, to the Almoravides, whose rule was supplanted in 1147 by that of the Almohades. In 1248 it was taken by Ferdinand III of Castile, when 400,000 Moors are said to have left for Granada and Africa. From this time it was the capital of Castile, and when Spain was united it was for a while the seat of the court until Charles V made Valladolid his residence. The city rose to extraordinary prosperity after the discovery of the New World, when it became the residence of princely merchants and the mart of the colonies, but its trade was afterward transferred to Cadiz. In 1810 it was taken and ravaged by Soult. Consult: K. E. Schmidt, *Sevilla* (Leipzig, 1902); W. M. Gallichan, *The Story of Seville*, in "Mediæval Towns Series" (London, 1903); A. F. Calvert, *Seville* (London, 1907).

SEVILLE, JOHN OF. See JOHN OF SEVILLE.

SEVILLE, SAINT ISIDORE OF. See ISIDORE OF SEVILLE, SAINT.

SÈVRES, sā'vr'. A town in the Department of Seine-et-Oise, France, 7 miles southwest of Paris (Map: Paris and vicinity). It is celebrated for its government porcelain factory, established in 1756, and its school of ceramics. The public museum has specimens of pottery and porcelain wares representing every period and country and exhibiting the various stages in the development of the industry. The town hall has a handsome collection of paintings and sculptures, and a normal school for females occupies the old porcelain-factory building. Pop., 1901, 8216; 1911, 8395. Consult E. Garnier, *Soft Porcelain of Sèvres, with an Historical Introduction* (London, 1892); M. Lyendecker, *La manufacture nationale de Sèvres* (Thouan, 1913), containing a bibliography. See PORCELAIN, and Colored Plate.

SÈVRES, DEUX. A western inland department of France, between the departments of Vienne on the east and Vendée on the west (Map: France, N., E 6). Area, 2337 square miles. Pop., 1911, 337,627. The department takes its name from two rivers, the Sèvre-Niortaise, which flows west into the sea, and the Sèvre-Nantaise, an affluent of the Loire. It is traversed from southeast to northwest by a chain of hills, called in the southeast the Monts du Poitou and in the north the Plateau de Gatine. This ridge forms the watershed between the Loire on the north and the Charente on the south. The climate is healthful, and the soil fertile. Cereals, the grapevine, sugar beets, flax, and various fruits are cultivated. There are numerous coal and iron mines and good quarries of freestone and marble. Capital, Niort.

SEWAGE (from *sew-*, the apparent base of *sewer*) **DISPOSAL.** The question of the best means for removing household wastes from individual premises was only beginning to receive general attention in 1850, but to-day collection and removal may be considered as no longer in question. The sanitary emancipation of hundreds of small and scores of large towns and cities followed the introduction of the separate system of sewers (see SEWERAGE AND DRAINAGE), with its relatively small, cheap, and self-cleansing pipe-conduit system. But sewers, or the water-carriage system of waste removal, sometimes proved to be only a temporary solution of the disposal problem, on account of the consequent pollution of public water supplies and the less important, but much more palpable, offense to the nostril and eye caused by the fouling of streams and other bodies of water.

It must be understood that in the long run

practically all these household wastes must reach either the water or the soil, and that ultimately the bulk of the liquid portion reaches the water. Disposal of sewage on land is a recognized method of purification, but discharge into water, provided the volume of water be large enough and not used for domestic supplies, may be just as effective and sanitary. Nature has abundant means for transforming all organic wastes into harmless and useful products. But the capacity for this in a given area of land or body of water is limited. Until the adoption of the water-carriage system of sewerage, household wastes were deposited on or in the soil. With the concentration of people in cities the soil became overburdened, and recourse was had to the nearest water. As soon as nuisances arose here, and particularly when it began to be seen that public water supplies were thus endangered, there was a return to land, only the disposal now was collective instead of individual and remote from instead of upon each man's premises. Through a lack of knowledge of the principles involved, or because either of a scarcity of proper land or of money to buy and prepare it, the sewage farms became oversaturated, clogged, and offensive.

It was then sought to relieve these areas by removing the solids from the sewage, a plan which had been and continued to be carried out in the case of water disposal. A further motive, where the sewage was discharged into water, was the desire to save the fertilizing material in the sewage. Sedimentations or, when this process was hastened, chemical precipitation was the method employed. Some went so far as to believe that chemical precipitation alone would effect all the purification necessary, as well as recover fertilizing material of great value. Unfortunately the process was only a partial one and left the decanted liquid, or sewage effluent, in a condition which was likely to give rise to great offense. At the same time the precipitate, or sludge as the solid matter is called, proved to be unavailable for plant food. The next step was to try to coax a given area of land to do more work than before. The means employed, intermittent filtration, was to apply the sewage at intervals on specially prepared areas, called filter beds, with periods of rest between. The raising of crops was made quite secondary or abandoned. In some cases the filter beds were supplementary to sewage farms, designed to receive the sewage when it would flood the crops; in others, effluent from precipitation works was applied to the beds.

Where suitable land is available, intermittent filtration is all that could be desired, in degree of purification effected, but in many sections the proper sort of land (sandy and easily drained) cannot be had. The relatively high rates of application, as compared with sewage farming, clog the beds with the organic matter retained on and in the filtering material. Recourse to sedimentation or to chemical precipitation, many times tried, revives the old sludge problem.

In the early days of sewage disposal no one dreamed that of the various systems in use, including disposal in water, all but one of the practicable processes depend upon bacteria for their efficiency, and that this single exception, chemical precipitation, would one day be held up as opposed to nature. Such has proved to be the case. The theory of intermittent filtration, when it was at last established on a scientific basis, was that the bacteria involved were aërobic, or require an abundance of oxygen for their life processes. On this account the sewage, which passes continuously through the beds while in service, was shut off at more or less frequent but regular intervals, depending on the character of the filtering material. As the sewage drained out of the beds air was sucked in to take its place, thus affording a new air supply for the bacteria in the beds, which, between dosings, could occupy themselves with the stored organic matter. In contact beds the germs are given a longer period to work on the sewage, there being a sequence of filling, standing full, emptying, and finally resting, each cycle requiring from 8 to 24 hours, according to the periods of rest, which vary with local conditions. If one bed does not effect a sufficient degree of purification, a second and finer one, and even a third, may be employed. In case the sewage is held so long in a bed that the oxygen is exhausted, the aërobic bacteria give place to the anaërobic, or those thriving in the absence of oxygen. In percolating or sprinkling filters the sewage is distributed over the beds by means of either fixed or revolving sprinklers. The beds are composed of coarse material, are thoroughly underdrained, and in general are designed to expose the sewage to a plentiful supply of air as it trickles through them. Anaërobic action may be secured by employing a receptacle containing no filtering material, known as the septic tank or, in its later forms, the Travis hydrolytic tank or the Imhoff tank, through which the sewage flows slowly, but in which the suspended matters are retained by sedimentation, to be acted upon and partly reduced in volume by the bacteria. The septic effluent may be discharged on to filter beds or into water not used for domestic supply, if the latter is ample in volume, and the effluent from bacteria beds may be used.

In addition to the processes or partial processes of treatment thus far sketched screens and also grit chambers are frequently used to remove suspended matter, while to reduce bacteria hypochlorites or else liquid chlorine is employed for disinfection. From time to time, beginning about 1887, various electrolytic processes have been experimented with, but up to 1915 only a few permanent plants of this type had been installed, the largest being at Oklahoma City, Okla. Forced aëration of sewage has also been widely experimented with. In 1914 and 1915 a new process of aëration, called the activated-sludge method, was studied in laboratories and in small-scale-working plants at many places. The process was an outgrowth of aëration studies at Lawrence, Mass. (State Board of Health), modified and carried forward at Manchester, England, by Gilbert J. Fowler, and subsequently taken up in elaborate detail at Urbana, Ill. (State Water Survey), Milwaukee, Wis., and a number of other American cities. Early in the year 1916 both Milwaukee and Cleveland, Ohio, were building large working-scale units of activated-sludge tanks. In essence the process consists of intimately mingling air, sewage, and accumulated sewage solids or sludge in tanks. The admission of compressed air through porous plates or diffusers at the bottom of the tanks diffuses both the air and the sludge through the sewage under treatment, causes rapid aërobic bacterial action, and produces a quick-settling

effluent, rid of a large part of its organic contents. Some of the experiments indicate that a high percentage of the bacteria may be removed from the sewage by this means, and others give reason to hope that the sludge drawn off from the activated-sludge tanks may be of considerable value as a fertilizer. The practicability of the process, particularly as regards cost, had not been determined early in 1916, but was sufficiently promising to lead some engineers and chemists to hope that the process may prove to be a great step in advance.

Before describing more fully such of the sewage-treatment processes already mentioned as have been used extensively it may be noted that a variety of local conditions may require a high degree of treatment at one place and may permit, perhaps for years to come, a slight treatment elsewhere, while still other cases may call for a degree of treatment anywhere up or down the scale. Screening and sedimentation are known as preliminary processes, and the various kinds of filtration as oxidation or final processes, with secondary sedimentation, a second filtration, or even disinfection as finishing processes in some cases.

Dilution is the method of sewage disposal most commonly employed outside of England. As usually practiced it can scarcely be said to be a system of disposal, since the sewage is discharged into the nearest body of water with little regard to consequences. In Massachusetts, New York, New Jersey, Ohio, and a gradually increasing additional number of States, all new disposal schemes must be approved by the State Board of Health. Similar approval is required in the leading Canadian provinces. In England all new disposal works involving loans must be approved by the Local Government Board. The stringent legislation against water pollution renders the employment of dilution alone a less common practice there than in America. In Germany there is also central control, but a high degree of treatment is not demanded, stress being put on water rather than on sewage treatment, and the use of unpolluted ground water being encouraged. The first principle in disposal by dilution, indeed, in all sewage disposal, is never to endanger a public water supply; the second is not so to overload the stream or other body of water as to create a nuisance.

The best example in the United States of disposal by dilution was furnished first by the city of Boston and afterward by Boston and other near-by towns united to form the Metropolitan Sewerage District. The various communities in the district have their individual sewerage systems, which connect with large trunk or outlet sewers, leading to carefully selected points of discharge. The Chicago Drainage Canal (q.v.) is by far one of the most notable works ever undertaken for the disposal of sewage by dilution. The canal has never received diluting water to its full capacity, points relating to the effect on navigation of the diversion of water from Lake Michigan being before the Federal courts at the close of 1915.

Broad Irrigation, or Sewage Farming, does not differ essentially from ordinary irrigation (see IRRIGATION), except for the fact that sewage is used instead of normal water and that the sewage is applied the year round, or as nearly so and in as large quantities as the land and crops will permit. The sewage farms of Berlin, Germany, which date from 1876, had a total area of 43,000 acres early in 1910, of which about a half had been prepared for the reception of sewage, and a quarter were being used for ordinary farming. Some of both classes of area were rented to farmers. Contrary to common report, these sewage farms are operated at a loss, as are sewage farms generally. Sewage farming has been practiced but little in the United States, and that almost wholly in the Far West, where water is in great demand for irrigation. Relatively few new sewage farms have been established since 1900, and many of the old ones have been partly or wholly given up or at least supplemented by other methods of treatment. See SEWAGE FARMING.

Sedimentation alone is sometimes all the treatment that is required, but more generally it serves as a preliminary to some more efficient process. When combined with screens for the retention of coarse floating matter, settling tanks may be used to lighten the work of filter beds or to diminish water pollution.

Chemical Precipitation is little more than accelerated sedimentation, although under certain conditions some of the dissolved organic matter is removed. A chemical with the power of precipitating, or throwing down, the suspended matters is admitted to and mixed with the sewage by simple means, after which the sewage passes to the settling or precipitating tanks, which are generally rectangular and not very deep. The sludge resulting from the process is either pumped to filter presses or is run on to drainage beds, the object in either case being to reduce the water contents. The final disposal of the sludge is often no easy task. It was originally supposed that it would sell readily, but as a rule managers of sewage works are fortunate if they can get farmers to remove it as a gift. Sometimes it is used to fill in land. In England sludge is not infrequently burned in refuse destructors, or garbage furnaces, with other town refuse. Another means of sludge disposal, available for seaboard cities, is dumping it at sea. The London County Council employs a fleet of seagoing vessels for this purpose. Chemical precipitation will remove about 50 per cent of the total organic matter in sewage and nearly all the matter in suspension. The chemical most commonly used is lime, and next to it stands sulphate of alumina. The two are frequently used together.

The first chemical treatment plant for town sewage seems to have been put in use at Manchester, England, in 1844. The use of lime was suggested by Dr. Thomas Clark of Aberdeen, who, during the same year, invented the lime process for softening water. (See WATER PURIFICATION.) In the United States a small chemical precipitation plant was installed at the Brighton Beach Hotel on Long Island, N. Y., in 1880, and the first town plant to treat sewage with chemicals was at Long Branch, N. J., where the works were put in operation in 1886. From 1887 to 1890 several additional chemical plants were built, the most notable one being installed at Worcester, Mass., in the latter year. In 1900 the city of Providence, R. I., opened the largest chemical precipitation plant yet built in the United States. Since then but few new chemical precipitation works have been built to treat city sewage in any part of the world, owing to the widespread use of septic tanks of the old or the newer types.

Intermittent Filtration marks a new era in

sewage disposal. The amount of sewage which can be treated on one acre of intermittent filter beds ranges from 20,000 to 100,000 gallons a day, according to the character of the material. Within these limits ordinary sewage may be brought to a high degree of purity. The best material for this process is a fairly coarse, angular sand, but with proper dosing either fine or very coarse sand may be used. Loamy earth is not suited for intermittent filtration on account of the low rates which must be employed; clayey soils are out of the question. Crops may be grown on intermittent filtration areas, providing they are made secondary to the purification of the sewage.

The essential feature of **Contact Beds** is the retention of the sewage a longer time in the beds than is possible with intermittent filtration, after which there is a resting period similar to that in the older process, but shorter. The contact beds were evolved in England because of the scarcity of sandy land suitable for intermittent filtration. It being necessary to transport sand or some other filtering material and make it up into wholly artificial beds, it was imperative that the more expensive beds should treat the sewage at a higher rate. This was found to be possible, but the purification not being sufficiently complete for all conditions, a second or even a third bed was added where necessary.

The development of contact beds was begun in 1892 at the Barking chemical precipitation plant of the London sewerage system by W. J. Dibdin, chemist to the London County Council, aided by George Thudichum, with an experimental filter bed consisting of 3 feet in depth of coke, broken to small fragments. These experiments were continued at the London works by Mr. Dibdin and others, but up to 1916 London still relied upon chemical precipitation alone for sewage treatment. Contact beds built under Mr. Dibdin at Sutton, Surrey, have been followed by hundreds of others in England and other parts of the world, but the percolating or sprinkling filter has been in greater favor for many years, notably so in the United States.

Percolating Filters were developed about the same time as contact beds, a number of Englishmen taking a hand in the task. The material for contact beds may be broken stone, coke, coal, or hard furnace clinker, stone being most generally used in America. For percolating filters the range of choice is not so large. The material for percolating filters is much larger than that for contact beds, particularly in England, where chunks as large as a man's head are sometimes used. For contact beds the choice of material may range all the way from ¼ inch to 1 or even 2 inches. If double contact is employed, the material in the secondary beds is finer than that in the primary beds. The rates of filtration in these two processes vary over a considerable range, but may be put at, say, 500,000 gallons per acre per day for contact beds and 1,000,000 to 2,000,000 for percolating filters —almost invariably accompanied by supplementary treatment for the removal of suspended matter.

The Septic Tank is designed to provide the first stage of bacterial action, mentioned just above, without the intervention of filtering material. The sewage first enters a small grit chamber, where sand and like heavy matter are speedily deposited on account of their relatively great weight. The sewage then goes on to a narrow and rather long and shallow tank, having a trapped inlet and outlet, the better to exclude the air. The bulk of the suspended organic matter is deposited and retained in this tank. The anaërobic bacteria seize upon and break up the sludge, which is transformed into dissolved and gaseous matter. The former passes out with the tank effluent. As any sludge left behind remains in the tank week after week, there is no lack of opportunity for complete bacterial reduction. The sludge accumulates by slow degrees. The tank effluent, as has been stated, is about as well purified as that from chemical precipitation tanks, but there remains less sludge for final disposal.

The septic-tank system was put in use at Exeter, England, in August, 1896, by Mr. Donald Cameron, town surveyor. Since then many other septic tanks have been built. The Exeter tank, like others built under Mr. Cameron's patents, was tightly covered to exclude air and light.

It is asserted that the septic tank was developed independently at Urbana, Ill., in 1894 by Prof. A. N. Talbot. Certainly he built a tank there and then which acted in much the same way as the septic tank. In 1895 he designed a more pretentious one for Champaign, Ill., which was built in 1897. Consult Metcalf, "Antecedents of the Septic Tank," in *Proceedings of the American Society of Civil Engineers* (New York, 1901).

The Imhoff Tank, sometimes called the two-story settling tank, is a modified septic tank, the upper story of which is a settling chamber and the lower story a sludge-digesting chamber. The sediment from the upper chamber slides down sloping bottoms through slots into the lower chamber. The weight of the sewage above the sludge in the conical-shaped bottom of the sludge chambers presses the sludge out through pipes on the opening of valves. This sludge is generally discharged on to sludge-drying beds of sand or gravel, from which it is removed for final disposal. The clarified sewage or effluent from Imhoff tanks, like that from other settling tanks, may be discharged into a stream or other body of water, or filtered, or filtered and disinfected, according to local governing conditions.

Manufacturing Wastes may generally be discharged into town sewers. Occasionally they are of such a character as to demand separate treatment, or the conditions may be such that proper treatment will result in the recovery of some product of commercial value. Much information on the subject may be found in the reports of the Massachusetts State Board of Health and in *Water Supply and Irrigation Papers* of the United States Geological Survey.

Houses not Connected with Sewers. Although, as now understood, sewage is limited to those household and industrial wastes which are removed by sewers, it will be convenient to consider in addition the disposal of excrementitious matters and fouled water from such houses and other buildings as are not connected with the sewers. In rural districts this is generally a simple matter. Privy vaults, whether adjoining or more or less remote from houses, are generally little more than holes in the ground, into which the wastes fall and where they remain until removed at frequent intervals. The occasional addition of small quantities of dry earth or ashes will do much to lessen the almost inevitable nuisances of these devices. Wherever de-

cency and a due regard for health prevail this leads to the adoption of some portable receptacle which can be kept in a sanitary condition. The two chief means employed to meet this demand are the earth-closet and the pail system. The former is said to have been invented in 1858 by the Rev. Henry Moule, vicar of Fordington, England. He utilized the deodorizing powers of common soil and devised a mechanism for automatically dumping some of it into the closet when needed, somewhat on the same principle as the flushing arrangement for a water-closet. In the earth-closet a bucket or some larger receptacle may be used for the reception and removal of wastes. The pail system is not much different from the earth-closet, except that no earth or other deodorizer is necessarily used. The pails should be made of metal or some other nonabsorbent material. Tight-fitting covers should be provided. With the introduction of the water-closet, with its flushing tank and its pipe for the removal of wastes from the houses, a new problem arose in the way of final disposal. If no cesspool had been provided for sink and bath wastes, one was built somewhere in the yard. These also are generally mere holes in the ground, walled up roughly to prevent the caving in of the earth, but not made water-tight. In sandy soils the liquid soaks away. The solid matters are decomposed in the manner explained in the paragraph on septic tanks. In clayey or wet soils cesspools are sure to overflow. Theoretically all cesspools should be water-tight, but practically only a very few are.

The contents of earth-closets may be utilized as fertilizing material with but little difficulty, either by composting or by direct application to the land. The utilization of pail-system wastes is not so easy, since they contain a large percentage of moisture. An absorbent may be used to reduce the moisture, or the pails may be emptied where their contents can drain out. Still another way is to reduce the stuff to a powder in some form of drier. Occasionally night soil from the pail system, and possibly from privies, is burned in garbage furnaces, care being taken to mix it with the driest material available. One of the best means of disposing of all night soil and allied matter is to bury it in trenches.

The Sanitary Privy. With the knowledge of the rôle of the house fly in disseminating typhoid fever (q.v.) much attention has been given to designing and educating the rural population to use privies made tight against flies by good construction and by screening. Mosquito breeding in wet privies has also to be guarded against in some places, and everywhere care must be taken to avoid soil pollution, especially where wells used for domestic purposes would be endangered. The sanitary privy is also an essential factor in the control of the hookworm disease (q.v.) in the Southern States. The various State boards of health, the United States Public Health Service and Department of Agriculture stand ready to distribute printed information on sanitary privies and the rural sewage disposal. See FILTER AND FILTRATION; IRRIGATION; FILTER PRESSES; SEWERAGE AND DRAINAGE; WATER SUPPLY.

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SEWAGE EARTH-CLOSET. See SEWAGE DISPOSAL.

SEWAGE FARMING. The utilization of sewage in the growth of field, orchard, and garden crops. It has long been practiced in different parts of the world with varying success. The success of the Chinese in thus utilizing what would otherwise be wasted has often been cited as a fine example of thrift and economy.

The largest, best-known, and best-managed sewage farms in the world are those of Paris and Berlin, to which should perhaps be added that of Danzig. The main object of these farms, however, is to provide a means of municipal sanitation through the utilization of the sewage in the growing of crops, with the expectation that the returns from the latter will meet or greatly reduce the cost of the enterprise. As a matter of fact the Paris farms do not pay expenses and are less fully meeting the sanitary requirements year by year. The Berlin farms are more nearly meeting sanitary and financial requirements.

There are a large number of sewage farms of varying size in England, but only a small proportion of them are self-supporting. This is partly because in comparatively few cases are the soil and climatic conditions favorable.

The great obstacles in the way of the success of sewage farming as a means of sewage disposal or municipal sanitation are: (1) the difficulty of finding sufficiently large areas of suitable land conveniently located with reference to

sewage supply; (2) the irregularity of the demand for the sewage at different seasons and for different crops; (3) the dilute, offensive, and possibly dangerous character of the material.

One of the first requirements for successful sewage farming is a light porous soil overlying gravel with good drainage. It is obvious that more sewage can be successfully utilized in a dry, open climate than in a cold and wet one. This accounts for the comparative success of sewage irrigation as practiced in certain parts of Italy and the drier portions of the United States. In such cases the irrigation value of the sewage is often greater than the fertilizing value, for it should always be remembered that while the aggregate of fertilizing matter carried by it is enormous, sewage, and especially American sewage, is a very dilute fertilizer.

Analyses show that while the composition of American sewage is very variable, there is on the average probably less than two parts of solid matter in 1000 of sewage, and that a ton of sewage may contain only from 0.15 to 0.25 pound of nitrogen, 0.045 to 0.065 pound of phosphoric acid, and 0.025 to 0.040 pound of potash. These would probably have a cash value of from three and one-half to five cents. Moreover, since in actual practice much of the nitrogen is lost, the real fertilizing value of sewage will probably not exceed three cents per ton, and one to two cents per ton is perhaps more nearly its true manurial value.

The three principal methods of application of sewage are: (1) broad irrigation without underdrainage; (2) irrigation with drainage; (3) application after preliminary treatment. The first is the oldest and probably still the most generally practiced method, although the third is increasing in favor, especially from the standpoint of efficient purification. Broad irrigation has been practiced sucessfully for over 300 years on a private farm at Bunzau, Prussia, and for some 200 years on the Craigentinny Meadows near Edinburgh.

The crops best suited to sewage farming are perennials like the grasses, although vegetables and a variety of other crops have been successfully grown with sewage. The experience of the Berlin farms shows that with proper care there need be little danger to health in using raw sewage for this purpose. In order to use the sewage most regularly and to the best advantage, separate areas of land must be provided for rotation in application. See SEWAGE DISPOSAL.

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SEWALL, sū'al, MAY WRIGHT (1844–). An American educator, lecturer, and author, born in Milwaukee, Wis. She graduated at Northwestern University in 1866 and in 1880 married Theodore L. Sewall, who died in 1895. For many years she was prominently identified with the woman's suffrage movement and with the education of women. She was officer of many women's clubs and delegate to numerous women's congresses, both in the United States and abroad. She was one of the lady managers of the Columbian Exposition at Chicago in 1893, in 1900 was a commissioner to the Paris Exposition, and in 1915 was identified with the Panama-Pacific Exposition. For a long time she was principal of a girls' classical school in Indianapolis, Ind., founded by her husband. Latterly Mrs. Sewall made her home at Eliot, Me. She wrote on woman suffrage and kindred topics, edited *Historical Résumé of the World's Congress of Representative Women* and *The International Council of Women*, and published *Women, World War, and Permanent Peace* (1916).

SEWALL, SAMUEL (1652–1730). A Colonial jurist, born at Bishopstoke, England. He emigrated with his parents to Massachusetts in 1661 and graduated at Harvard in 1671. He was a judge of the Superior Court from 1692 to 1728, being Chief Justice for the last 10 years of this period. He presided over trials at the time of the witchcraft delusion, but later realized the worthlessness of the testimony on which the victims had been convicted and in 1697 prepared a confession of his error, which was read, in his presence, to the congregation of the Old South Church, Boston. He was widely known as a philanthropist and in 1700 wrote a pamphlet against slavery entitled *The Selling of Joseph*. He also wrote: *An Answer to Queries Respecting America* (1690); *The Accomplishment of Prophecies* (1713); *A Memorial Relating to the Kennebec Indians* (1721); *A Description of the New Heaven* (1727). His *Diary* (from 1674 to 1729) and his letter books, both published in the *Collections of the Massachusetts Historical Society*, are invaluable for the light they throw on the social history of early New England. Consult N. H. Chamberlain, *Samuel Sewall and the World he Lived in* (Boston, 1897).

SEWANEE (sē-wą'nē) **UNIVERSITY.** See SOUTH, UNIVERSITY OF THE.

SEWARD, sū'ērd. An Alaskan town situated on Resurrection Bay, Kenai Peninsula, the southern terminus of the Alaska Northern Railroad (Map: Alaska, J 5). Pop., 1910, 534; temporarily increased in 1915 by the railway immigration. During the heavy winter season Seward supplants Anchorage, on Knik Arm, a branch of Cook Inlet, the summer centre of railway construction.

SEWARD, ALBERT CHARLES (1863–). An English botanist, born in Lancaster and educated at Cambridge. He served as lecturer in botany at Cambridge from 1890 to 1906 and thereafter as professor. He wrote: *Fossil Plants as Tests of Climate* (1892); *The Wealden Flora* (2 vols., 1894–95); *Fossil Plants for Students of Geology and Botany* (2 vols., 1898–1910); *Jurassic Flora* (2 vols., 1900–04); *The Jurassic Flora of Yorkshire* (1911); *Mesozoic Plants from Afghanistan* (1912). He edited *Darwin and Modern Science* (1909).

SEWARD, ANNA (1747–1809). An English author, a daughter of Thomas Seward, canon of Lichfield. She wrote verses and hence was styled the Swan of Lichfield. She also wrote a poetical novel called *Louisa* (1782) and a *Memoir of Dr. Darwin* (1804), in which she laid claim to the exordium of *The Botanic Garden*. Miss Seward was a woman of great beauty. Her *Poetical Works and Correspondence* (3 vols., 1810) was published under the supervision of

Scott, and her correspondence appeared in six volumes (1811).

SEWARD, Clarence Armstrong (1828–97). An American lawyer and public official, born in New York City. He graduated at Hobart College in 1848, studied law, and practiced it after 1854 in New York City. In 1856–60 he was Judge-Advocate-General of New York State. In 1860 he went to Virginia to protest against its secession from the Union. He entered the Civil War as colonel of the Nineteenth New York Volunteers. In 1865, after the assault upon his uncle, Secretary Seward, and upon his cousin, Frederick William Seward, he was called to Washington to act as Assistant Secretary of State. At the time of his death he was president of the American Express Company.

SEWARD, Frederick William (1830–1915). An American lawyer and diplomat, the son of William H. Seward. He was born in Auburn. N. Y., graduated at Union College in 1849, was admitted to the bar in 1851, and in the same year became assistant editor and part owner of the Albany *Evening Journal*, then controlled by Thurlow Weed. From 1861 until 1869 he was Assistant Secretary of State under his father. On April 14, 1865, he was severely wounded while defending his father against an assassin. In 1867, with Admiral David D. Porter, he was sent to the West Indies, where the two negotiated a treaty with Santo Domingo, and he also took part in the negotiations for the purchase of Alaska. In 1875 he was a member of the New York State Assembly and from 1877 to 1881 was again Assistant Secretary of State. In addition to articles in magazines and reviews he published *Life and Letters of William Henry Seward* (1891) and *A West Indian Cruise* (1894).

SEWARD, George Frederick (1840–1910). An American diplomat, born at Florida, N. Y., nephew of W. H. Seward. He was educated at Seward Institute and Union College. In 1861 he was appointed United States Consul at Shanghai and cleared the Yang-tse-kiang of pirates claiming American citizenship. From 1863 to 1876 he was Consul General at Shanghai and was appointed Minister to China in 1876. Because of his opposition to the restriction of Chinese immigration he was recalled in 1880 and engaged in business in New York City. He published *Chinese Immigration in its Social and Economic Aspects* (1881) and *Digest of System of Taxation of New York* (1902).

SEWARD, William Henry (1801–72). An eminent American statesman, born in Florida, Orange Co., N. Y., May 16, 1801. He attended an academy at Goshen, N. Y., graduated at Union College in 1820, studied law in New York City, was admitted to the bar at Utica in 1822, and in 1823 settled in Auburn for professional practice. He married the daughter of his partner, Judge Elijah Miller. In 1830 he was elected to the State Senate by the Antimasonic party, to whose first national convention he had been a delegate. As Senator he won distinction by his support of internal improvements, the common schools, and political reforms. In 1838 he was elected Governor of New York as a Whig. His administration was signalized by notable improvements in schools, prisons, judicial reform, and internal improvements. His term was marked by the antirent troubles (see Anti-Rentism) and the controversy over the McLeod affair. (See Caroline, The.) In 1840 he was reëlected. After the expiration of this term (1842) he gave his time to his profession at Auburn. In 1849 he was elected to the United States Senate, took a prominent place among Whig-party leaders, and became an intimate counselor of President Taylor. In the debate on the Compromise Measures of 1850 (q.v.) he delivered an able speech denouncing slavery and declared that "there is a higher law than the Constitution." He vigorously opposed the Kansas-Nebraska Bill (q.v.). In 1855 he was reëlected to the Senate, in spite of the opposition of Know-Nothings and Whigs of Southern sympathies. He was influential in the organization of the Republican party and at first was generally regarded as its leader. In October, 1858, he made a notable speech at Rochester, in which he spoke of the antagonism between freedom and slavery as an "irrepressible conflict" which could only terminate by the United States becoming entirely a slaveholding nation or entirely free. Prior to the Republican Convention at Chicago he was the most conspicuous candidate for the Republican nomination for President in 1860 and on the first ballot received 173½ votes, but was finally defeated by Abraham Lincoln. After Lincoln's election Seward became Secretary of State and rendered services of great value to the nation, holding the office during the Civil War and the four years of Johnson's administration. He negotiated many treaties and directed the foreign relations of the United States during a critical period with tact and success. Seward conducted the *Trent* affair (q.v.), questions arising out of French intervention in Mexico, and the matter of Great Britain's obligations as a neutral nation. (See Alabama Claims.) He brought about the purchase of Alaska from Russia (1867). His State papers are models of clear and vigorous style. During the war he supported President Lincoln in his efforts to raise and equip armies and approved the emancipation proclamations. On the evening of April 14, 1865, the day on which President Lincoln was assassinated, an assassin named Payne entered Seward's room and inflicted dangerous wounds upon him as well as upon his son. He recovered, however, and continued as Secretary of State in the cabinet of President Johnson until the end of his term. He entertained moderate views of Reconstruction and supported the plan of President Johnson, thus alienating from himself the more radical wing of his party. Upon his retirement from office in 1869 he made a journey to Alaska and in 1870 made a trip around the globe, visiting Europe, Asia, and Africa and being received with great honor. He died at Auburn on Oct. 10, 1872. His speeches and orations appeared in five volumes (New York, 1890), and his official correspondence was published by order of Congress. Consult: Gideon Welles, *Lincoln and Seward* (New York, 1874); T. K. Lothrop, *William Henry Seward*, in "American Statesmen Series" (new ed., Boston, 1899); Frederic Bancroft, *Life of W. H. Seward* (2 vols., New York, 1899); E. E. Hale, *William H. Seward* (Philadelphia, 1910); also, Olive Seward, *William H. Seward's Travels around the World* (New York, 1873).

SEWARD PENINSULA. The westernmost part of Alaska, having an area of about 22,700 square miles (Map: Alaska, E, F 3). The coasts are low and timberless, but the interior

rises into hills which are clothed in the east and centre with spruce forests. The economic importance of the peninsula rests on its gold productivity, which comes almost entirely from placers. Anvil Creek, the Nome beaches, and Ophir Creek are especially famed for their bonanza outputs, which in three consecutive years amounted to $13,425,000. Of this vast amount more than $1,000,000 came from an area of one-tenth of a square mile. The output for the entire peninsula up to 1914 amounted to $66,000,000, the district having the most productive placers, area considered, in Alaska. The peninsula is divided into five mining districts, Nome, Council, Kougarok, Fairhaven, and Port Clarence. Originally a placer country, the development of gold lodes is gradually changing industrial conditions, and the mining has passed very largely into the hands of corporations. Tin is profitably mined in the Cape York region. Lignite coal abounds in many localities, but has as yet been mined in rare cases. There are also vast beds of peat suitable for fuel. Besides the Nome Railway there are two railroads, the Golovin Bay, 6.5 miles, and the Council City and Solomon, 33 miles. The principal settlements besides Nome (q.v.) are Candle, Deering, Council, Golovnin, Igloo, Kotzebue, Shismaref, Teller, Wales, and Sinuk. Consult A. W. Greely, *Handbook of Alaska* (Washington, 1914), and *Bulletins of the United States Geological Survey*, Nos. 225, 247, 345, 370, 442, 520 (ib., 1904–12).

SEWEL, sū'el, WILLIAM (1654–1720). A Quaker historian and scholar. He was born and lived all his life in Amsterdam. His *History of the Rise, Increase, and Progress of the Christian People Called Quakers*, published in Dutch at Amsterdam in 1717 and in English translation (by himself) at London in 1722 (reprinted, Philadelphia, 1855), is a standard work. Consult his *Life* in the edition published at New York (1844).

SEWELL, ANNA (1820–78). An English author, born at Yarmouth. She became famous for her book, *Black Beauty: His Grooms and Companions* (1877), which is the autobiography of a horse. The book had a sale of 90,000 copies by 1890, was translated into French, German, and Italian, and has continued to be one of the most popular books for children ever written.

SEWELL, JONATHAN (1766–1839). A Canadian jurist, son of Jonathan Sewall (1728–96), Attorney-General of Massachusetts, who about 1777 changed the spelling of his name to the English form. He was born at Cambridge, Mass., was educated at Bristol, England, and in 1785 went to New Brunswick and studied law. He removed to Lower Canada, was called to the bar of that province in 1789, and practiced his profession in the city of Quebec. He was appointed Solicitor-General in 1793, Attorney-General in 1795, and from 1808 till 1838 was Chief Justice of Lower Canada. While Chief Justice he was also President of the Executive Council (1808–29) and Speaker of the Legislative Council (1809–38). He made a notable decision in 1818, which formed the basis of settlement of the dispute as to boundaries between the Dominion of Canada and the Province of Ontario. (See MOWAT, SIR OLIVER.) Sewell instituted important changes in court procedure. He also published a *Plan for a General Federal Union of the British Provinces in North America* (1815) and is sometimes credited with having been the first to propose Canadian federation.

SEWELL, MARY (1797–1884). An English author who wrote verses for children and young people. Of her *Mother's Last Words* (1860) more than 1,000,000 copies were sold. Consult *Poems and Ballads* (London, 1886), edited with memoir by Mrs. Bayly, and *Mrs. Bayly's Life and Letters of Mrs. Sewell* (ib., 1889).

SEWELL, ROBERT VAN VORST (1860–). An American mural painter. He was born in New York City and studied for four years in Paris under Lefebvre and Boulanger. Among his numerous decorations, which are well composed, of pleasing color, and spirited in execution, are the well-known "Canterbury Pilgrims," at Georgian Court, Lakewood; the "Story of Psyche," a series of lunettes in the Palm Room of the St. Regis Hotel, New York; and others in various studio buildings. In 1889 he was awarded the first Hallgarten prize at the National Academy of Design, of which he was elected an associate in 1901. He made his residence at Oyster Bay, Long Island.

His wife, AMANDA BREWSTER SEWELL (1859–), became known as a portraitist. Her work is reminiscent of the old English masters. At the National Academy of Design, of which she became associate (1903), she received the Dodge prize (1889) and the Clarke prize (1903).

SEWEL'LEL (Chinook Indian *she-wal-lal*, robe made of sewellel hide), or MOUNTAIN BEAVER. A curious little beaver-like rodent (*Haplodon rufus*) of the mountains from northern California to British Columbia, which lives in wet places overgrown with vegetation, where it makes extensive burrows and runways often kept wet by running water. They usually live in colonies and hibernate, preparing for the winter by cutting and collecting great quantities of woody plants and ferns, which they carry to places near their burrows and spread out to dry thoroughly before taking them into their burrows as stored food. The Indians ate them and made much use of their soft fur. A second species (*Haplodon major*) has been described from California. The many structural differences from the beaver have led to placing the sewellels in a family (Haplodontidæ) by themselves. They are regarded as most nearly representing the ancestral type of the squirrels.

SEWERAGE (from ML. *exaquatorium*, drainage canal, from Lat. *ex*, out + *aqua*, water) AND **DRAINAGE** (from AS. *dreahnian*, to drain). The removal and disposal of liquid and waterborne solid household wastes, the freeing of towns and cities from surface water, and the lowering and removal of subsoil water.

The two fundamental principles in the design of sewerage systems are: (1) the removal of sewage before offensive decomposition sets in, which may be effected by providing sewers of ample capacity, uniform and sufficient slope, and smooth interiors; (2) the disposal of sewage in such a manner that neither water, soil, nor air will be polluted thereby. Sewerage systems are generally divided into two portions: the collecting sewers and appurtenances and the outfall sewer or sewers. In addition there may be disposal works, including either a pumping or a purification plant, or both. The aim always is so to design the collecting and outfall sewers that the discharge may be by gravity, thus avoiding the expense of a pumping plant.

Sewerage systems, as now understood, date chiefly from the middle of the nineteenth century. A few ancient cities had sewers for the

removal of fouled liquids as well as for drainage. The most notable instance of this was Rome. (See CLOACA.) But the Roman sewerage system did not serve the whole population by any means. The drainage of London was the subject of legislation as early as 1225, but down to 1815 it was a penal offense to discharge excrement or other offensive matter into the drains of that city. In 1847 the first Act was passed making it compulsory to drain London houses into the sewers, and in 1859 work was begun on a system of intercepting sewers and storage tanks to cut off the discharge of sewage into the Thames within the city.

Paris had drains prior to 1536, but in 1663 their total length is said to have been only about 6 miles, of which 1½ miles were closed and the remainder open channels. In 1820 Paris made the use of cesspools obligatory, but permitted the liquid overflow to be discharged into the sewers. In 1880 a move was made to permit the discharge of all house sewage into the sewers, but up to the close of 1893, or just before the full adoption of the sewerage plan, of 266,044 houses in the city only 10,934 were directly connected with the sewerage system.

In the United States, Boston had drains as early as 1701. After the adoption of a city charter in 1823 Boston assumed the ownership and control of all the drains and sewers which had been built by private parties.

It may be said of all cities that a sanitary sewerage system, as now conceived, is out of the question until a copious water supply has been provided. In most of the larger cities provisions for surface drainage preceded the introduction of sanitary sewers. Convenience gradually led to the use of these surface or storm sewers for the disposal of liquid and then of solid house wastes, the connections for the latter purpose often being surreptitious at first. As public water supplies were introduced and the per capita water consumption greatly increased, the disposal of the water thus brought into the houses often became even more serious a matter than the removal of surface and ground drainage. This led to the construction of sewers on the combined plan. The expense involved in building sewers large enough to carry off the rainfall was almost or quite prohibitive for all but the larger, closely built cities, so as the need for house sewerage systems increased sewers were built more and more frequently for this purpose alone.

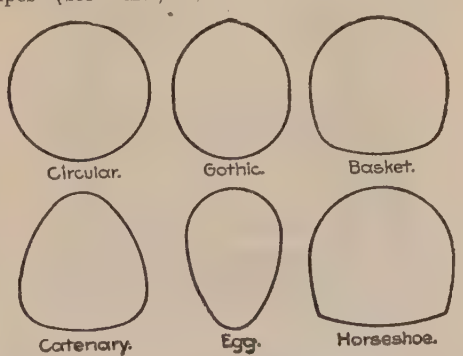
About 1850 the separate system was introduced in several English towns. In 1875–76 a separate system of sewerage was built at Lenox, Mass., and in 1880 a more extensive one was constructed at Memphis, Tenn. Both these were designed by the late Col. George E. Waring, Jr. The separate system, often but not always slightly modified to avoid controversy, has been widely adopted in the United States.

Designing a sewerage system necessitates first of all an accurate and complete topographical map of the city or town. The next step is to divide the city into its natural drainage areas, particularly if storm-water sewers are to be built. This done, the location of the main sewer for each district is determined and the tributary population estimated. The grades, or rate of fall per 1000 feet, should be so adjusted as to give self-cleansing velocities. At the same time economy in construction will keep the sewers as near the surface as is consistent with proper grades and serving the lowest plumbing fixtures in the houses.

The volume of sewage for which provision must be made is dependent on water consumption and rainfall. In the separate system of sanitary sewers rainfall need not be considered, since it is excluded, but some allowance must be made for the leakage of ground water into the sewers. In fixing the capacity of the combined system of sewers the house sewage scarcely need be considered except on the laterals serving single short streets, since the maximum surface or storm water to be carried is so far in excess of the house wastes. Ordinarily it is safe to assume that the maximum water consumption is double the average flow and that 75 per cent of the latter reaches the sewers, the remainder being used for lawn sprinkling and for houses not connected with the sewers. On this basis a city with an average daily water consumption of 100 gallons per capita would have a maximum consumption of 200 gallons, of which 150 gallons would reach the sewers. Under very unfavorable circumstances infiltration of ground water has been estimated as equal to the flow of sewage proper, but design and construction permitting such a condition should never be tolerated. Under normal conditions of both consumption and infiltration the extra volume on the latter account may be taken at 15 per cent of the assumed sewage flow. In round numbers, then, the capacity of separate sanitary sewers should be 175 gallons per capita per day.

The amount of rainfall for which provision must be made is a more difficult problem than might appear at first thought. There must be determined, first of all, the maximum rate of rainfall during comparatively brief periods, and next the percentage of the total which will reach the sewers at the same moment. As to the percentage of rainfall reaching the sewers in a given time, much will depend upon the permeability of the soil, the proportion of roofed and paved to the total area of the district, and the slopes of the area. The general practice is to base the calculations on the rate of rainfall per hour. An old rule for populous districts was to make the sewers large enough to carry away a rainfall of one inch per hour. The more recent short-period observations show that far higher rates may reach the sewers.

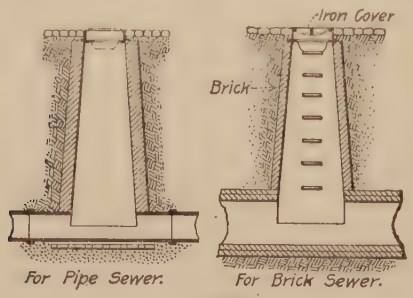
Material. Vitrified clay or terra-cotta sewer pipes (see PIPE) are now almost universally



OUTLINES OF VARIOUS SHAPES OR CROSS SECTIONS OF SEWERS AND DRAINS.

used for small sewers. Until recently brick was the most common material for the larger sizes of sewers, with stone as a substitute in some

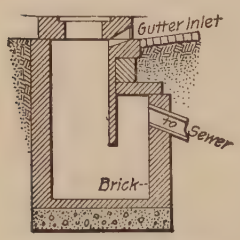
cases. Since 1900 concrete, plain or reënforced, has been coming into more and more general use, sometimes built continuously in place, sometimes built up from segmented blocks, and sometimes in jointed pipe lengths. In 1915 segmented terra cotta or vitrified blocks were gaining in use. Wood and steel have been used for large outfall sewers, especially for submerged pipe. Crossings beneath streams are frequently made



MANHOLES.

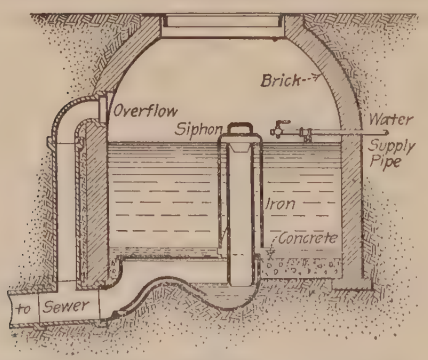
by means of so-called inverted siphons. Where feasible, large sewers other than iron are smaller at the bottom than the top, in order to concentrate the dry-weather flow and diminish the chances for stoppage.

Accessories include manholes, or chambers giving access to the sewers from the street; lampholes and handholes, for inspecting and cleaning separate sanitary sewers; flush tanks, for suddenly releasing a supplementary volume of water; catch or inlet basins, for the admission of surface drainage to combined or storm sewers. The latter are generally at the curb line. Such deposits as cannot be flushed out of the sewers must be removed from time to time by passing a ball, scraper, or other device from manhole to manhole.



CATCH OR INLET BASIN.

Automatic Flush Tanks are provided in many sewers of the separate type. They are



AUTOMATIC FLUSH TANK.

chambers for storage of water, with means for its sudden discharge down the sewer. The discharge is generally effected by means of a siphon, which comes into action when the water in the tank reaches a certain level. Another kind of automatic arrangement is an irregularly shaped bucket or tank, so arranged that when it has been filled by the supply pipe its centre of gravity is disturbed and the water discharged by tilting. Automatic flush tanks should discharge at least once in 24 hours and liberate some 200 or 250 gallons of water at each action. In the combined system of sewers all these methods of flushing are liable to be inadequate, except in the smaller sewers. Cleaning by hand or otherwise then becomes necessary.

Ventilation of Sewers is a thing which has given rise to much discussion. The simplest means are generally the best, and it is rarely the case in sewers that any improvement can be made over thoroughly good design and execution in the way of grade, alignment, and smooth interiors. In some English cities ventilating shafts have been provided, but this has rarely if ever been done in America. Perforated manhole covers are about all the specific provision for ventilation made in the United States. The omission of traps at the foot of the house soil pipes will contribute no small amount of ventilation and is sometimes practiced. Objection to this plan is offered by some on the ground of danger to the inmates of houses if the soil pipes are converted into as many ventilating shafts, but in properly designed and constructed sewers, having such ample ventilation as is thus afforded, there is a growing belief that no reason for apprehension will follow the practice. The sewer gas of which so much was said some years ago does not exist—as a specific gas. Sewers, and particularly those retaining deposits of organic matter for considerable periods, may yield various gases of decomposition, and under extrême conditions these gases may be positively and immediately dangerous. Numerous careful studies have shown that the bacterial contents of the air in sewers resemble those of the outer air above, rather than the bacteria in the sewage, and that they are comparatively few in numbers. In fact the air in anything approaching a model sewer is better than that in overcrowded theatres and churches. The menace of sewerage systems is the pollution of public water supplies, not the air of either streets or buildings. Nevertheless great care should be taken to prevent the accumulation of bad air in sewers and to reduce to a minimum the access of any sewer air to houses or other buildings.

Pumping Works for sewage do not necessarily differ much from those for water, except that they generally lift the sewage but a few feet and should be of a type not readily damaged by foreign matter. Centrifugal pumps are often used to lift sewage, as being economical, with low lifts, and having no valves likely to get out of order. Other kinds of steam pumps are used; also air displacement pumps, known as Shone ejectors, and pumps driven by the sewage itself, known as sewage lifts.

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Sewer Design (2d ed., New York, 1913); Metcalf and Eddy, *American Sewerage Practice* (3 vols., ib., 1914–15), on design, construction, and disposal. See also references under SEWAGE DISPOSAL.

SEWICKLEY, sē-wĭk'lĭ. A borough in Allegheny Co., Pa., 12 miles west-northwest of Pittsburgh, on the Ohio River and on the Pennsylvania Railroad (Map: Pennsylvania, A 6). It is a residential suburb of Pittsburgh and contains a hospital, fine high-school and post-office buildings, and a large public library. Pop., 1900, 3568; 1910, 4479.

SEWING MACHINE (from *sew*, AS. *seowian*). It is probable that the first sewing machine was made by an Englishman named Thomas Saint and was patented July 17, 1790. Though made of wood, it resembles the later successful machines in that it had an overhanging arm, vertically reciprocating needle, continuous thread, and automatic feed. This machine had a notch instead of an eye in the needle, for the thread to pass through, and a hole was punched by an awl for the needle to pass through. It produced a single-thread chain stitch. In 1830 Barthélemy Thimonier produced a sewing machine which was patented first in France and some time afterward in the United States. This machine was so far successful as to be employed to make clothing for the French army, and it thereupon was destroyed by an ignorant and furious mob. Thimonier's first machine was also of wood, but he afterward constructed one of metal, driven by a cord and treadle. It had the overhanging arm, flat cloth plate, vertical post, vertical reciprocating needle, continuous thread, and presser foot of the modern machine. The needle was hooked and had to be passed backward and forward through the cloth twice to complete a stitch. In 1841 Newton and Archbold patented in England a machine using an eye-pointed needle and producing a chain stitch.

About the same time that the French machine was being perfected Walter Hunt is said to have made a sewing machine having the double thread and lock stitch which was characteristic of the Howe machine. Hunt, however, failed to perfect or patent his invention for so many years after it was first put upon the market that when at length he applied for a patent it was denied him.

In 1846 Elias Howe (q.v.) patented a sewing machine containing most of the essential features of the modern machine. The needle was curved and moved back and forth horizontally instead of vertically. The machine, crude as it was, included the grooved eye-pointed needle and the automatic feed and produced a lock stitch by means of a shuttle operating on the opposite side of the cloth from the needle. Howe was for many years engaged in suits for infringement upon his patents. In these he was successful, and, unlike most of the earlier inventors, he received a large fortune from royalties.

In 1849 John Bachelder patented a machine which was the first to combine the horizontal table and the continuous feed device. The latter consisted of an endless band of leather set on to small steel points. These points projected up through the table and, penetrating the material, carried it to the needle.

A. B. Wilson invented in 1852 the vibrating double-beak shuttle and in 1854 the four-motion feed. The latter invention—the serrated metal bar covered with forward-pointing saw teeth—is the familiar feed plate now used on almost all machines. This toothed bar (1) rises through a slot in the table, (2) moves horizontally forward to advance the cloth, (3) drops below the table, (4) moves horizontally back again to its starting point below the table.

In 1851 Isaac M. Singer patented a sewing machine having a fixed overhanging arm and a vertical needle. He also introduced the foot treadle, previous American machines having been operated by turning a crank with the hand. The most important invention which he contributed was the presser foot, with a yielding spring.

There are two types of domestic sewing machines: those making a lock stitch and those producing a chain stitch, or the double and single thread machine. Some double-thread machines produce a chain stitch. Each type has its adherents among seamstresses. The lock stitch resembles weaving in its formation, while the chain stitch resembles knitting and is easily raveled. According to the census for 1900, 90 per cent of the machines built for household use have the lock stitch. The modern household sewing machine has been developed to a high degree of efficiency and usefulness. Many attachments are supplied, so that its range is widely increased. Thus it is now possible to embroider, buttonhole, shirr, hem, tuck, darn, gather, and do various other forms of sewing with facility on one machine, while in clothing and other factories special forms are adapted for single operations.

Among the sewing machines for doing special kinds of work or work on special materials are the shoe and leather sewing machines, the carpet-sewing machine, and the buttonhole machine. By far the most important of these, in practical results attained, is the shoe-sewing machine. The McKay machine was invented in 1858 by Lyman R. Blake and with its numerous improvements exerted a tremendous effect on the shoe industry. It was developed by Colonel McKay and was the result of three years of patient labor and of an expenditure of over $130,000 before practical results were attained. This machine was used extensively both in the United States and in Europe, but it possessed the disadvantage that the shoes, though strong and comfortable when first made, could not be resoled except by pegging or nailing and possessed in addition soles stiff and lacking in flexibility. In the Goodyear welt machine, for which patents were granted in 1871 and 1875, a welt was sewed to an upper, and this welt in turn was fastened by an external row of stitches to the sole. Shoes made in this way were much more flexible and could be half-soled by the shoemaker by the ordinary process of hand sewing. This machine at once found application to the manufacture of fine boots and shoes, and on it at the present time are made nearly all of the finer grades of men's shoes.

The first machine for sewing leather and other heavy materials was patented by J. J. Greenough in 1842, but did not come into extended use. The following year a similar machine was patented by George H. Corliss, the inventor of the Corliss engine. It had two needles with eyes near their points, which worked horizontally through holes previously punctured by awls. The movements were derived from cams

on a revolving shaft, and the feed was automatic. Leather-sewing machines are now used in all branches of the leather industry, including the sewing of the uppers of shoes and the different kinds of stitching required in the manufacture of gloves.

A buttonhole machine was first patented by Humphrey in 1862, but the Reece buttonhole machine, patented nearly 20 years later, first brought the art of making buttonholes by machinery to its present state of perfection. There are several styles of these machines now on the market.

An invention patented in 1894 is a machine for sewing the breadths of carpeting. It differs from other sewing machines in that it, and not the material, moves along as the process of sewing advances.

Statistics. The value of the export trade of the United States in sewing machines for the fiscal year specified was as follows: 1900, $4,541,774; 1905, $6,104,279; 1910, $7,513,852; 1911, $9,039,840; 1912, $9,947,312; 1913, $11,573,746; 1914, $11,494,801; 1915, $6,223,521. According to the Thirteenth United States Census (Manufactures) there were, in 1909, 47 establishments in the United States engaged in the manufacture of sewing machines and cases. These factories had a combined capital of $33,103,704, and the value of their annual product was $28,262,416. Of these there were six establishments making sewing-machine cases, with an output valued at $2,492,742. In 1860 there were 88 factories, but the total amount of capital invested was only $1,494,450, and the annual product was $4,403,206. The popularity of this industry seems to have been at its height in 1880, when 124 factories were in operation. This is accounted for by the fact that in 1877 the disorganization of the sewing-machine combination, which controlled patents covering several of the essential features of the sewing machine, was effected, and thus the field was opened to numerous small manufacturers. Consult: Byrn, *Progress of Invention in the Nineteenth Century* (New York, 1900); "Manufactures," in *Twelfth Census of the United States*, vol. x, and *Thirteenth Census of the United States*, vol. viii (Washington, 1902, 1913); P. N. Hasluck (ed.), *Sewing Machines* (New York, 1905).

SEWING SPASM. See NEUROSIS.

SEX (Lat. *sexus*, sex). **In Animals.** The capacity, in all but the lowest organisms, of each individual producing either eggs or sperm cells (or both), i.e., germ cells which are either female or male. In the lowest or unicellular animals reproduction (q.v.) is by self-division or by germs, which so far as we know are devoid of sexuality; such forms are said to be asexual. The next step, one suggesting sexual reproduction, is the phenomenon of conjugation. In all animals from sponges to man reproduction is by male and female cells.

The ovary and testis are sexual glands (gonads) and may be regarded as the primary sexual organs. In nearly all animals from the flatworms to man there is a passage or outlet for the expulsion of the sexual products, and accessory organs for the dilution and expulsion of the seminal fluid or for secreting the eggshell; also external appendages of less or greater complexity in those forms which pair; and egg-laying organs, as the ovipositors of insects, brood pouches, and different forms of uteri. Judging by the lowest forms, animals were probably at first hermaphroditic, growing out of a unisexual condition. Hermaphroditism is a condition in which both male and female organs are developed in the same individual. There are two kinds of hermaphroditism, the true and the spurious; in the former the germ glands contain both male and female germ cells; in the latter the accessory organs are of an ambiguous character. Hermaphroditism is normal in some species and abnormal in others. Spurious hermaphroditism is met with in all diœcious groups. In insects it has been repeatedly noticed. Thus, one wing may have the male coloration and the one on the opposite side female coloration; or the anterior and posterior parts of the animal may have opposite secondary sexual characters; or the sexual characters may be intermingled or, more rarely, blended.

Among vertebrates abnormal hermaphroditism is rare. Fishes have, however, been described with an ovary on one side and a testis on the other, and birds have been repeatedly described with ambiguous secondary characters. These phenomena usually appear late in life, but they may occur in young birds, which are then usually sterile. A similar tendency to gain characters of opposite sex is seen in old persons, in whom the germ glands are no longer functional. Concerning the interpretation of abnormal hermaphroditism it may be said that at an early stage of development all animals are sexless, but their germ glands seem to possess the potentiality of both sexes; typically, in diœcious organisms only one of these potentialities is realized, but exceptionally both of them may be to a greater or less complete degree.

Origin of Sex.—This is an unsettled problem. We do not understand how, from being at first hermaphroditic or asexual, as was probably the case, the male and female characteristics became gradually established. What in the higher animals determines sex is also an unsolved problem. Hundreds of theories have been proposed as to the epoch at which the sex of the embryo is finally determined. Food or nutrition is as important a factor as any in determining what the sex of the future animal may be. Certain experiments throw light on the subject in the case of animals. Yung divided a batch of tadpoles into three lots, the percentage of females in each lot being respectively 54.46, 61.39, and 56.44. The average number of females was thus about 57 in 100. In the first brood, by feeding one set with beef, he raised the percentage of females from 54 to 78; in the second lot, fed with fish, the percentage rose from 61 to 81; while in the third lot, when the especially nutritious food of frogs was supplied, the percentage rose from 56 to 92; thus, in the last case the result of high feeding was that there were 92 females to 8 males. In the honeybee the queens are fed with richer, more nitrogenous food than the workers; hence in the latter the ovaries are undeveloped; it is so with the white ants and ants. In the wasps, when both males and females arise from fertilized eggs, Siebold's observations tend to show that predominance of females is due to better nutrition. Giron divided a flock of 300 ewes into equal parts, of which one-half were extremely well fed and served by two young rams, while those of the other half were served by two mature rams and kept poorly fed. The proportion of ewe lambs was 60 per cent and 40 per

cent. Dusing's experiments leave little doubt that abundant moisture and food tend to produce females, while high temperature produces males; he found that the heavier, well-fed ewes produced ewes, while the lighter, underfed ewes brought forth males.

Sexual Dimorphism.—This is due to the rise of secondary characters. Such features are the male lion's mane, the horns of the buck, the gay plumage which distinguishes the cock from the hen, and the plumes, colored combs and wattles, topknots, brilliant, conspicuous bands and spots, spurs, and those markings or new plumage especially developed during the breeding season. Males tend among vertebrates to be larger, they lead the flock, guard the females and young; in character they are more jealous and pugnacious. This is the case not only with mammals and birds, but with reptiles and frogs. The vociferous cries in spring of frogs and toads are mainly from male throats, the females being much less noisy. Certain fishes, as the salmon, during the breeding season are distinguished by bright colors and ornamental appendages. Of the invertebrates only insects, spiders, and crustacea afford examples. Among coleoptera the stag beetles (Lucanidæ) are remarkable for their size and the enormous jaws and horns of the males, and there are two sets of males, those which in lack of armature approach the females and those which are much larger and remarkably aberrant. In certain spiders the males are gayly colored and their legs greatly modified in shape. Darwin has explained sexual dimorphism by his theory of sexual selection (q.v.). Sexual dimorphism reaches its acme in the males of certain solitary barnacles; they are minute, very much reduced in structure, living inside the mantle cavity of the female, where they are anchored by their antennæ.

In Plants. The simplest plants give no indication of any sexual process, but reproduce by cell division or by nonsexual spores. The gradual transition from the sexless to the sexual condition is clearly shown in several groups of algæ. For example, *Ulothrix*, a green alga, consists of a single row of cells, each of which has ordinary vegetative powers. In some cells a few large ciliated swimming sexless spores are developed by cell division. Other cells produce numerous smaller similar bodies. Both sorts when discharged swim about and either directly form filaments, or they may fuse in pairs, thus producing a new cell, capable of developing a new vigorous individual. Since this fusing is the essential feature of the sexual process, botanists conclude that sexual cells have been derived from sexless swimming spores.

The sexual cells (gametes) at first appear alike, a condition distinguished by special terminology from that in which two sexes are distinct. Thus, the mother cell within which the gametes are developed is called a gametangium; the condition of having similar pairing gametes is isogamy; the act of fusion is conjugation; and the resulting sexually formed spore is a zygospore. Only the lower algæ and fungi are isogamous. Very early in the history of the evolution of sex in plants the pairing gametes began to differentiate. In one series the gametes became gradually larger and proportionately less active, until a relatively large and absolutely passive cell, the female gamete (egg or oösphere), was formed. In the other series activity was increased and size perhaps diminished, resulting in the formation of the male gamete (sperm, antherozoid, or spermatozoid). This differentiation of sex continues from the higher algæ throughout the plant kingdom, with the following special terminology. The gametangium which develops the sperms is called an antheridium (q.v.), and that which develops the usually single egg an oögonium among the algæ and fungi and an archegonium in the higher groups. The condition of having dissimilar gametes is heterogamy; the process of fusion is fertilization; and the resulting sexually formed spore is an oöspore or fertilized egg.

Although isogamy and heterogamy may be regarded as the normal stages in the evolution of sex among plants, there is a special form of sexuality among the red algæ (Rhodophyceæ, q.v.) that deserves mention. In this group, although a male cell or sperm is developed, as in cases of ordinary heterogamy, the female organ (procarp) develops no distinct egg, but is differentiated into two regions, viz., a bulbous base (carpogonium) with a hairlike prolongation (trichogyne) with which the male cell fuses, and thus fertilizes the carpogonium, by which, more or less directly, spores are developed. In this case, therefore, there is a sexual act involving a sperm or its equivalent but no egg. This sexual union does not result in a distinct spore, but in the final formation of a fruitlike structure (cystocarp) containing spores. This peculiar modification of heterogamy may be called carpogamy, which is fertilization of a carpogonium rather than of an egg.

With the development of heterogamy, which is the prevailing method in the plant kingdom, the development of sex in plants is practically complete. Certain resulting conceptions, however, should be considered. Among the bryophytes alternation of generations (q.v.) is established. The sexual plant (gametophyte), which is the ordinary leafy plant of popular conception, usually develops both sex organs upon the same individual and is said to be monœcious (bisexual or hermaphrodite). In some cases, however, antheridia and archegonia are borne upon different individuals (diœcious or unisexual). Among the pteridophytes, which is the lowest group to exhibit heterospory (q.v.), the sexual plant (prothallium), which may be either monœcious or diœcious, is very inconspicuous, but the leafy sexless plant is conspicuous.

By overlooking the homologies with pteridophytes, great confusion has arisen among the spermatophytes in reference to sexuality, and a sex terminology has been applied to certain sexless organs. In this highest group the sexual plants are so inconspicuous that they can be seen only with the special appliances of the laboratory. All the visible organs of a flowering plant, including the flowers, are sexless. Confusion has arisen because the stamens and pistils have been regarded, respectively, as male and female organs, an idea extended by the terms "ovary" for a part of the pistil and "ovule" for the contained structure which becomes a seed. The terms "monœcious" and "diœcious" are misapplied when used to describe plants which bear stamens and pistils, respectively, upon the same or distinct individuals.

While the sexual structures of plants are very conspicuous, therefore, among the lower forms, they gradually become more and more inconspicuous, until in the highest group they are

beyond the reach of ordinary observation. There is thus a gradual increase in the prominence of the sexless phase and a gradual reduction of the sexual phase. See METAZOA; REPRODUCTION; SEXUAL SELECTION.

Bibliography. Geddes and Thompson, *The Evolution of Sex* (New York, 1902); Otto Weininger, *Sex and Character* (ib., 1906; T. H. Morgan, *Experimental Zoölogy* (ib., 1907); C. W. Malchow, *The Sexual Life* (3d ed., Minneapolis, 1911); J. M. Coulter, *The Evolution of Sex in Plants* (Chicago, 1914); T. H. Morgan, *Heredity and Sex* (2d ed., New York, 1915); Emil Lucka, *Eros: The Development of the Sex Relation through the Ages* (ib., 1915).

SEX, AS A FACTOR IN EVOLUTION. As has been elsewhere stated (see SEX), the male is the more active, more variable, and specialized sex, while the female is passive, conservative, and departs least from the normal standard. It would be a natural result that the offspring would tend to vary. Weismann goes so far as to claim that the intermingling of the sexual elements in fertilization is the only cause of variation. Before him Treviranus, Brooks, and Galton claimed that sexual reproduction provokes variation. On the other hand the sexless Foraminifera are exposed to great variation, and we know that variation in general is due to the changed conditions of life, and the reproductive activities are generally acknowledged to be of secondary importance.

Mutual sterility, by which physiological barriers are erected, is supposed by Romanes to result in the origination of new species. Among the higher animals, as the social insects, birds, and mammals, which build nests, care for their young, and where love, coöperation, self-sacrifice come into play, sex becomes increasingly important in evolution and becomes a factor in the differentiation of sexual forms and in social evolution. See EVOLUTION.

SEX'AGES'IMAL SYSTEM. See SCALES OF NOTATION.

SEX'TANT (from Lat. *sextans*, sixth part, from *sextus*, sixth, from *sex*, six). An instrument used for measuring angles between distant objects. The sextant finds its greatest field of usefulness in navigation, but it is also employed

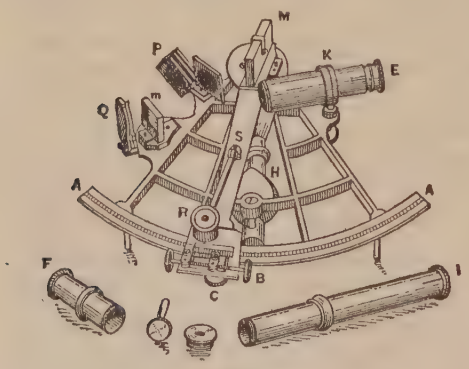


FIG. 1.

in marine surveying. It consists of a frame in the form of a sector embracing somewhat more than one-sixth (usually about one-third) of the whole circle; two mirrors (one wholly silvered and one silvered over one-half its surface); a movable arm pivoted at the centre of the sector and carrying the fully silvered mirror and a vernier; an arc along the circumference of the sector graduated into degrees, minutes, and seconds; and an eyepiece. The common form of the instrument is shown in Fig. 1.

The frame is of brass. *AA* is the limb in which is inlaid a strip of silver on which are the graduations of circular measure; the smallest divisions are usually 10′ to 30′, and the

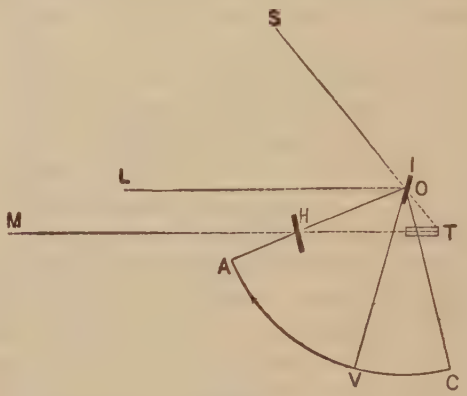


FIG. 2.

vernier enables angles to be read to at least 1′ and usually to 10″. The handle *H*, by which the instrument is held in the hand, is of wood. The mirrors *M* and *m* are of plate glass. The former has all its surface, while the latter has but the lower half, silvered. Both are fitted with small screws for adjusting them in perpendicularity to the plane of the front face of the frame and in parallelism to each other when the index arm is set at 0°. *E* is the eyepiece of the telescope, which is held in position by the adjustable clasp *K*. The mirror *M* is secured to the index arm *S*, which is pivoted beneath the centre of *M* and carries a vernier on its other end. *R* is a small magnifying glass for reading the vernier. *C* is the clamp for holding the index arm to the limb. *B* is the tangent screw for moving the arm slightly to perfect the angle; it acts only when the clamp screw *C* is set up. *P* and *Q* are colored shade glasses for use when observing the sun. Besides the ordinary telescope the instrument is usually provided with an inverting telescope, *I*, and a tube without glasses, *F*; also colored eyepieces to use in place of the colored shade glasses *P* and *Q*, and an adjusting wrench or screw driver. The theory of the instrument is shown in Fig. 2. *AOC* is the frame of the instrument in the form of a circular sector. *VO* is the index arm carrying the index glass *I* and the vernier *V* and is pivoted at *O* on the frame. *H* is the horizon glass, which is set in a clasp securely attached to the frame in a position parallel to *OC* (the position of the index arm when set at 0° of the arc), but is susceptible of adjustment if thrown out of position. *LO* is parallel to *MHT*. To determine the angle at the eye, *STM*, between two distant objects, *S* and *M*, the procedure is as follows: turn the instrument until one object, *M*, can be seen through the telescope and the unsilvered half (which is the half farthest away from the plane of the instrument) of the horizon glass *H*. Then turn the instrument until its plane coincides with that passing through both *M* and *S*. Now move the index arm until the reflection of *S* appears in the sil-

vered half of *H*. By slightly turning the instrument both objects will be brought together—one just on and one just clear of the edge of the silvered surface of *H*. Perfect the coincidence of the two objects, and the reading of the vernier at *V* will give the angle. For purposes of navigation the angle commonly measured is that

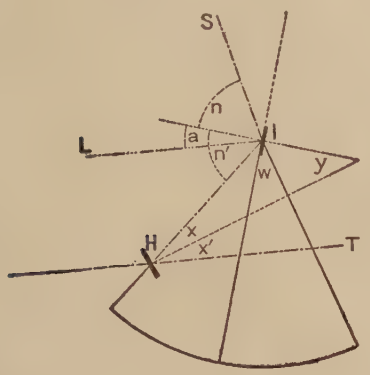


FIG. 3.

between the sea horizon and the sun, moon, star, or planet. The angle is called the altitude of the heavenly body; in the case of a star it can be taken only at twilight or when the moon is up, because the stars are not plainly seen by daylight, and the horizon is not clearly visible at night. From an inspection of the sketch (Fig. 3) it is readily seen that the angle through which the index arm moves is one-half that of the angle measured.

For n = angle of incidence and n' = the angle of reflection at the surface of the mirror *I* and x and x' the same at the mirror *H*, let *LI* be drawn parallel to *HT*. Then the angle measured is $SIL = n + a$; $n' - a = n - a = x + x' = 2x$; $n = x + y$; $2n = n - a + 2y$; $n + a = 2y$; $y = w$. $\therefore n + a = 2w$.

The arc, or limb, of the sextant has a graduated scale cut in an inlaid silver strip. The fineness of the graduation varies; in high-grade instruments the smallest division of the scale is 10 minutes; in some cheaper instruments the smallest division is one degree. To read the angle with great closeness sextants, like other similar instruments, are fitted with verniers (q.v.).

When used on shore and the sea horizon cannot be seen an artificial horizon is used. This consists of a shallow tray filled with mercury and protected by a gable-roofed cover of thin plate glass framed in brass. The angle measured is that between the sun (or other heavenly body) and its reflection from the level surface of the mercury. As is readily seen, this angle is double the altitude of the body. In place of the tray of mercury, silvered glass, laid horizontal by means of a set of levels and screws, is sometimes used.

As stated in the article on NAVIGATION, the sextant is a development of the cross-staff and astrolabe. The former consisted of a staff on which a cross was fitted so as to slide, its axis being perpendicular to that of the staff. The observer would sight from one end of the staff at the distant object and then move the cross until its end was in line with it and the eye. The angle was first measured by laying the instrument on paper and constructing the angle. Later the angles were marked on the staff, and crosses of various lengths were used. The astrolabe, which was constructed in several forms, consisted of a ring or disk with graduated scale and was provided with sights through which the navigator could view the sun or other heavenly bodies he was observing. The line of sight was usually a diameter of the circle, and a pointer was supplied by which the angle could be read.

In 1594 the celebrated navigator John Davies published in his pamphlet, *The Seaman's Secrets*, a description of his improved cross-staff. In using this instrument the observer stood with his back to the sun and looked at the horizon through a sight at the end of the staff while the shadow of a movable projection fell on the sight box. In 1729 Pierre Bouguer devised an improved form of the Davies instrument, and this was immediately followed by the appearance of the sextant. John Hadley described a double-reflecting octant in a paper dated May 13, 1731, and a few days later exhibited the instrument. About a year earlier Thomas Godfrey, of Philadelphia, designed a sextant. He made an instrument about November, 1730, and it was in actual use at sea before the end of the year. Hadley's instrument may have been the outcome of Bouguer's improved cross-staff, but Godfrey's seems to have been quite an independent invention. It may be noted also that Newton designed a double-reflecting instrument, similar to the sextant, and a description of it was found in Newton's own handwriting among Hadley's papers in 1742. Hooke also devised a similar one as early as 1674. It does not appear that any actual instruments were ever made on Hooke's or Newton's plans.

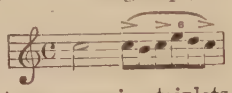
SEXTET' (from Lat. *sextus*, sixth). In music, a composition for six voices or instruments or for six obligato voices with instrumental accompaniment. Instrumental sextets are generally cyclical compositions in sonata form.

SEX'TON, ALEXANDER HUMBOLDT (1853–). An English metallurgist, born in London. He was educated at the Royal School of Mines, at the Royal College of Science in Dublin, and at the universities of Glasgow and Edinburgh. He was lecturer on chemistry and metallurgy in the Manchester Technical School (1882–84) and professor of metallurgy at the Royal Glasgow Technical College (1884–1909). He also became minister of the Jersey Society of the New church and later of the Liverpool Society. For a time he was president of the West of Scotland Iron and Steel Institute. Besides elementary textbooks on chemistry and metallurgy and numerous contributions to scientific and technical periodicals he wrote: *Elementary Text-Book of Metallurgy* (1895; 5th ed., 1911); *Fuel and Refractory Materials* (1897; new ed., 1910); *Chemistry of the Materials of Engineering* (1900); *Producer Gas* (1905); *Outline of the Metallurgy of Iron and Steel* (1908; 2d ed., 1912); *Alloys* (1908); *Principles of Ironfounding* (1911), with J. S. G. Primrose; *Assaying and Metallurgical Analysis* (2d ed., 1911), with E. L. Rhead.

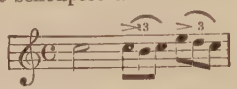
SEXTON, FREDERIC HENRY (1879–). A Canadian engineer and educator. He was born in New Boston, N. H., and was educated at Cambridge, Mass., and at the Massachusetts Institute of Technology. He was appointed assistant in metallurgy at the latter institution in 1902, afterward was employed by the General

Electric Company, Schenectady, N. Y., and in 1904–09 was assistant professor of mining engineering and metallurgy at Dalhousie University, Halifax. In 1907 he was appointed principal of the Nova Scotia Technical College and director of technical education in that province. He frequently contributed to scientific periodicals.

SEX'TUPLET (from Lat. *sextus*, sixth + *-plus*, -fold). In music, a group of six equal notes to be performed in the time of four. The true sextuplet is composed of three groups, of two notes each, being in fact a triplet (q.v.), with each of its notes subdivided into two:



But a group composed of two successive triplets is sometimes also called a sextuplet and written as such, though it is more correct to divide it into its component triplets, thus:



SEX'TUS EMPIR'ICUS. A Greek physician and philosopher, of the earlier half of the third century A.D., a pupil of Herodotus of Tarsus. As a physician he belonged to the Empirics, whence his cognomen. His first work, the celebrated *Pyrrhonic Sketches*, is a repository of the doctrines of the Skeptics; his second, *Against the Mathematici*, in 11 books, attempts to refute every item of positive knowledge that man had ever acquired. These works furnish the best account extant of ancient skepticism and its methods of assailing all manner of opinions. His works are edited by J. A. Fabricius (Leipzig, 1718, with a Latin translation) and by Bekker (Berlin, 1842). Consult: Brochard, *Les sceptiques grecs* (Paris, 1887); Jourdain, *Excursions historiques et philosophiques* (ib., 1888); Pattrick, *Sextus Empiricus and the Greek Sceptics* (Cambridge, 1899, with translation of book i of the *Pyrrhonic Sketches*); Christ-Schmid, *Geschichte der griechischen Litteratur*, vol. ii, part ii (5th ed., Munich, 1913). See SKEPTICISM.

SEXUAL SELECTION (Lat. *sexualis*, relating to sex). This principle depends, as Darwin states, not on a struggle for existence, but on a struggle between the males for possession of the females. The result is not death to the unsuccessful competitor, but few or no offspring. In many cases, however, victory depends not on general vigor, but on the possession of special weapons confined to the male sex, as the spurs of the cock or the horns of the stag.

The war is perhaps severest between the males of polygamous animals, and these seem oftenest provided with special weapons of offense. Among birds the contest is often less gross and fierce, the males rivaling each other in attracting the females by their powers of song or display of plumage. Darwin concludes "that when the males and females of any animal have the same habits of life, but differ in structure, color, or ornament, such differences have been mainly caused by sexual selection; i.e., by individual males having had, in successive generations, some slight advantage over other males, in their weapons, means of defense, or charms, and having transmitted these advantages to their male offspring." Although Wallace does not accept the theory of sexual selection, claiming that bright colors were originally normal in both sexes, but have been eliminated in the females, yet the facts seem to substantiate the views of Darwin. As observed by Romanes, it is "a theory wholly and completely distinct from the theory of natural selection."

Bibliography. A. R. Wallace, *Darwinism* (2d ed., London, 1890); G. W. and E. G. Peckham, *Sexual Selection in Spiders* (Milwaukee, 1890); Charles Darwin, *Origin of Species* (new ed., London, 1906); E. B. Poulton, *Essays on Evolution* (Oxford, 1908); Dewer and Finn, *The Making of Species* (New York, 1909); A. C. Seward (ed.), *Darwin and Modern Science* (Cambridge, 1909); Charles Darwin, *Descent of Man and Selection in Relation to Sex* (new ed., New York, 1909).

SEYBOLD, zī'bôlt, CHRISTIAN FRANZ (1859–). A German Orientalist, born at Waiblingen, near Stuttgart. In 1893 he became privatdocent of Semitic languages at Tübingen and was promoted to associate professor in 1897 and full professor in 1901. His writings include: *Ibn al Anbari, Asrar al Arabija* (1886); *Breve noticia de la lengua Guaraní* (1890); *Vocabulario de la lengua Guaraní* (1892); *Arte de la lengua Guaraní* (1893); *Sujutis Schamarikh altarikh* (1894); *Glossarium Latino-Arabicum* (1900); *Die Drusenschrift Kitabalnoqat waldawair* (1901); *Historisches Patriarcharum Alexandrinorum I* (1904); *Historisches Patriarcharum Alexandrinorum II* (1910); *Aben Hazam de Córdova, Nocatalarus fi tavariji aljolafa* (1911); *Severus ibn al Muqaffas Alexandrinorum Patriarchengeschichte* (1912).

SEYCHELLES (sā'shĕl') **COCONUT,** or DOUBLE COCONUT (*Lodoicea callipyge*, or *sechellarum*). A palm whose fruit somewhat resembles a coconut, but which belongs to a different tribe, being allied to the Palmyra palm. It is native to the Seychelles Islands and was known for many years only by the fruit, which, found floating in the Indian Ocean or upon the shores of the Maldive Islands, was long the subject of many ridiculous fables and is still an object of interest and curiosity, and as such is one of the minor articles of commerce. The slender tree grows to the height of 100 feet with a tuft of immense leaves. The cabbage or terminal bud is eaten. The melon-shaped fruit, which it is said requires 10 years to ripen, sometimes weighing as much as 40 pounds, is often a foot or a foot and a half long and is the largest fruit known. Its outer husk is green, the interior near the base divided into two parts, at first filled with a white sweet jelly, which changes into a white horny kernel.

SEYCHELLES ISLANDS. A group of small islands belonging to Great Britain and situated in the Indian Ocean 650 miles northeast of Madagascar (Map: Africa, K 5). With the dependent groups, the Amirante, Cosmoledo, and Aldabra Islands lying to the southwest, this archipelago numbers 90 islands, with a total area of 156 square miles. The largest is Mahé, whose area is 55½ square miles. The Seychelles are of Archean rocks, remnants supposedly of an ancient land, are composed mainly of granite, with basaltic intrusions, and are surrounded with coral reefs. The climate, tempered by the surrounding ocean, is very equable. The rainfall is very abundant, averaging nearly 100 inches per year, and the islands are covered with luxuriant forests. The flora is largely composed of species peculiar to the islands (see SEYCHELLES COCONUT); the fauna is related to that of Madagascar; and mammals, with the exception of bats, are wanting. The soil is fertile, and cotton, rice, and tobacco are cultivated.

The chief exports are copra, guano, vanilla, cinnamon bark, tortoise shell, calipee, soap, cocoanut oil, various essential oils, coconuts, and whale oil. Imports and exports were valued at £66,727 and £69,077 in 1900 and £83,329 and £165,613 in 1913. In 1903 the islands were formally erected into a separate colony under its own governor and commander in chief. The capital is Victoria, a port in Mahé; its harbor is safe and commodious. The population, chiefly French Creoles, Indian coolies, and negroes, increased from 14,081 in 1881 to 19,237 in 1901 and 22,691 in 1911 (Mahé, 17,721; Praslin, 2018; La Digue, 1364; other islands, 1588); estimate at end of 1913, 23,777 (12,039 male, 11,738 female).

The islands are believed to have been discovered by Pedro Mascaregnas, a Portuguese, in 1505. They became the resort of pirates, and in the middle of the eighteenth century were colonized by the French. Taken by the British in 1794, they continued under French administration until 1810 and were formally ceded to Great Britain in 1815. Consult: E. Belcher, *Account of the Seychelles;* A. A. Fauvel, *Bibliographies des Seychelles;* J. S. Gardiner, *The Seychelles;* Hartmann, *Madagascar und die Inseln Seschellen* (Leipzig, 1886).

SEYDLITZ, zīt'lĭts, Friedrich Wilhelm von (1721–73). A brilliant Prussian cavalry officer, born at Kalkar, near Cleves. For gallantry at the battle of Hohenfriedberg he was made major of hussars and by 1755 had received the rank of colonel. As the result of his distinguished services in the Seven Years' War he became known as the first cavalry officer of the period, and for a brilliant charge at Kolin in 1757 he was made a major general of cavalry by Frederick II. At Rossbach he gained much glory and the rank of lieutenant general. He took part in the battles of Zorndorf and Hochkirch and at Kunersdorf was severely wounded. After the last-named battle he was for some time in disfavor with Frederick and was not permitted to take part in active operations, but in 1762 he was once more in the field and won new renown at the battle of Freiberg. In 1767 he was made a general of cavalry. A marble statue was erected in his honor in the Wilhelmsplatz at Berlin.

SEYFFARTH, zī'fârt, Gustav (1796–1885). A German-American Egyptologist, born at Uebigau in Saxony. He studied at the University of Leipzig and under Champollion in Paris in 1820. He became professor of philosophy at Leipzig in 1825 and professor of archæology in 1829. From 1826 to 1829 he visited the principal museums of Germany, France, England, and Holland and collected copies of Egyptian inscriptions and Coptic manuscripts. In 1856 he came to America and became professor of Church history and archæology in Concordia College, St. Louis. From 1859 he resided in New York City. Seyffarth was an earnest student of Egyptology, but wrongly held that the hieroglyphic characters, with scarcely an exception, were pure phonograms. His principal works are: *Rudimenta Hieroglyphica* (1826); *Systema Astronomiæ Ægyptiacæ* (1826–33); *Unser Alphabet ein Abbild des Tierkreises* (1834); *Alphabeta Genuina Ægyptiorum et Asianorum* (1840); *Die Grundsätze der Mythologie und der alten Religionsgeschichte* (1843); *Grammatica Ægyptiaca* (1855).

SEYMOUR, sē'mōr. A town in New Haven Co., Conn., 10 miles northwest of New Haven, on the Naugatuck River and on the New York, New Haven, and Hartford Railroad (Map: Connecticut, C 4). The manufactures include paper, iron castings, eyelets, wire, metal novelties, tools, submarine cables, brass, copper, German silver, horseshoe nails, mohair plush, fountain pens, and bicycle parts. Seymour was settled as part of Derby in 1678. Pop., 1900, 3541; 1910, 4786. Consult Sharpe, *History of Seymour* (Seymour, 1902).

SEYMOUR. A city in Jackson Co., Ind., 60 miles south of Indianapolis, on the Baltimore and Ohio Southwestern, the Pittsburgh, Cincinnati, Chicago, and St. Louis, and the Chicago, Terre Haute, and Southeastern railroads (Map: Indiana, F 7). It has woolen mills, flouring mills, printing houses, planing and saw mills, and manufactories of furniture, carriages, buggies, harness, and advertising novelties. Repair shops of the Baltimore and Ohio Southwestern also are here. There is a public library, and a free farmers' club building. Pop., 1900, 6445; 1910, 6305.

SEYMOUR. A noble English family of Norman descent. In 1497 the head of the family, Sir John Seymour, was employed in suppressing the insurrection of Lord Audley and the Cornish rebels and subsequently accompanied King Henry VIII on his wars in France. One of his daughters, Lady Jane, became the wife of Henry VIII and mother of Edward VI. His fourth son, Thomas, was sent on important missions, made Privy Councilor, and after Henry VIII's death was created Baron Seymour of Sudeley and Lord High Admiral. He then secretly married Henry's widow, Catharine Parr. A rivalry sprang up between him and his eldest brother, Edward, Lord Protector Somerset, whom he wished to supplant. His machinations gave color to a charge of treason, a bill of attainder was passed by the Lords, and Seymour was executed March 20, 1549. His brother, Edward, who held many high positions in the court of Henry, was created Viscount Beauchamp of Hache in 1536 and Duke of Somerset in 1546–47. (See Edward VI.) After a two years' tenure as "Protector and Governor" attainder followed. A son of the Protector by his second marriage was created by Elizabeth Earl of Hertford. The grandson of the latter, William, who succeeded him in the Earldom of Hertford, was sent to the Tower for marrying Lady Arabella Stuart (q.v.), cousin of James I of England. His ducal title passed to a cousin and was inherited by Charles Seymour, the "proud Duke of Somerset," who filled several high posts in the courts of Charles II, William III, and Anne. Consult R. H. St. Maur, *Annals of the Seymours* (London, 1902), and A. A. Locke, *The Seymour Family* (ib., 1911).

SEYMOUR, Sir Edward Hobart (1840–). An English naval officer. He was educated at Radley and entered the navy in 1852. He distinguished himself as a youth in the Crimean War (1854–55) and in the war with China (1857–62), was wounded while serving in West Africa in 1870, and was captain of the *Iris* in the Egyptian War of 1882. He was advanced to the rank of rear admiral in 1889, to vice admiral in 1895, and to admiral in 1901. While in command of the China station (1898–1901) he took an active part in the Boxer War. In June of that year he led an expedition from Tientsin for the relief of the foreigners besieged in Peking, but was opposed by such overwhelm-

ing forces that he was obliged to return without effecting his purpose. He represented England at the Hudson-Fulton celebration at New York in 1909. He was created G.C.B. in 1900 and G.C.V.O. in 1906, and in 1902 received the Order of Merit. Sir Edward wrote *My Naval Career and Travels* (1911).

SEYMOUR, Frederick Beauchamp Paget, Baron Alcester. See Alcester.

SEYMOUR, George Franklin (1829–1906). An American Protestant Episcopal bishop. He was born in New York City and was educated at Columbia and at the General Theological Seminary, New York, where he was professor of ecclesiastical history from 1865 to 1879, being made dean in 1875. For several years he had been warden of St. Stephen's College, Annandale, which he had founded. In 1874 he was elected Bishop of Illinois, but in the bitterness of theological controversy at that time failed of confirmation. In 1878, however, he was consecrated first Bishop of Springfield. He was a deputy from the Protestant Episcopal church at the Old Catholic Congress at Vienna in 1897. Known throughout the United States as an accomplished theologian and as an acute and forceful controversialist, representing the High Church position, he published, among various works, *What is Modern Romanism?* (1888).

SEYMOUR, Horatio (1810–86). An American political leader, the son of Henry Seymour, a colleague of De Witt Clinton. He was born at Pompey Hill, Onondaga Co., N. Y., educated at Geneva Academy (later Hobart College) and at Middletown (Conn.) Military Academy, studied law at Utica, and in 1832 was admitted to the bar. In 1841, as chairman of the Canal Committee in the State Legislature, he prepared an elaborate report, which served for many years as the basis of legislation in connection with the State canals. In 1842–46 he was mayor of Utica and in 1852 became Governor of New York. The period of his governorship was marked by factional strife and by a temperance movement which, on a second nomination, resulted in his defeat. When the election of Lincoln made civil war seem inevitable, he made efforts for a compromise, but later supported the Lincoln administration. In 1862 he was again elected Governor. He advocated the vigorous prosecution of the war, but protested against the extensive use of war powers by Lincoln. He strove to keep New York's full quota of troops in the field. His attitude in regard to draft riots in New York City in July, 1863, was the cause of much criticism, but his measures proved efficacious. In 1868 he was president of the Democratic National Convention which met in New York City, Seymour himself receiving its presidential nomination. He received 80 electoral votes to 214 for Grant. After this he took no further part in political affairs. Consult Croly, *Seymour and Blair: Their Lives and Services* (New York, 1868), and Hartley, *Horatio Seymour* (Utica, 1886).

SEYMOUR, Lady Jane (c.1509–37). The third Queen of Henry VIII. She was the eldest child of Sir John Seymour and sister of Edward, Duke of Somerset and Protector of England. She was married to the King shortly after the execution of Anne in 1536. The following year she gave birth to a son, afterward Edward VI, and died 12 days later. Consult Martin Hume, *The Wives of Henry the Eighth and the Parts they Played in History* (Edinburgh, 1905).

SEYMOUR, Thomas Day (1848–1907). An American Greek scholar, born in Hudson, Ohio. After graduating from Western Reserve College in 1870 he studied for two years at Leipzig and Berlin. From 1872 to 1880 he was professor of Greek in Western Reserve College and thereafter till his death professor of the same subject at Yale. He was made chairman of the managing committee of the American School of Classical Studies at Athens in 1887, was editor in chief of the *College Series of Greek Authors,* and one of the American editors of the *Classical Review.* In 1888 he was president of the American Philological Association. His publications include: *Selected Odes of Pindar* (1882); *Introduction to Homeric Language and Verse* (1885); *Homer's Iliad* (i–iii, 1887; iv–vi, 1890); *School Iliad* (1889); *School Odyssey* (1897), with Perrin; *Life in the Homeric Age* (1907); a revision of Dyer's edition of Plato, *Apology and Crito* (1908).

SEYMOUR, Truman (1824–91). An American soldier, born at Burlington, Vt. Graduating from West Point in 1846, he entered the artillery and fought throughout the Mexican War. He served against the Seminoles in Florida and in 1861 was an officer at Fort Sumter, where he earned the brevet of major. He became brigadier general of volunteers, was in the Peninsular campaign, and was brevetted colonel after Antietam. He led the second assault on Battery Wagner (1863), where he was wounded, and commanded the expedition into Florida which was defeated at Olostee (1864). He took part in the Richmond campaign until the Wilderness, where he was captured. After exchange he commanded a division in the Shenandoah valley, at the siege of Petersburg. He left the volunteer service with brevet rank of major general in 1865 and (1866) was commissioned colonel of the Fifth regular artillery. He retired in 1876.

SEYMOUR HADEN, Sir Francis. See Haden, Sir F. S.

SEYNE-SUR-MER, sān'sụr'mâr', La. A seaport in the Department of Var, France, 3 miles southwest of Toulon (Map: France, S., K 5). It has extensive shipyards employing over 5000 hands, manufactures olive oil and soap, and is the seat of a considerable trade. Oyster culture also is a growing industry. Pop., 1901, 21,002; 1911, 22,093.

SFAX, sfäks. A fortified seaport of Tunis, situated on the Gulf of Cabes, opposite the islet of Kerkenna (Map: Africa, F 1). The Mohammedan or upper town is surrounded by walls and extensive gardens and contains a fine mosque. The lower city along the water is devoted to trade. The modern harbor contains a naval dock and repairing slips for the sponge and fishing vessels, and the town carries on an extensive trade in fruit, phosphates, sponges, essence of flowers, nuts, oil, woolens, and camels. Sfax was occupied in 1881 by the French. Pop., about 45,000.

SFORZA, sfôr'tsà. A celebrated Italian family. The founder of the family fortunes was a peasant of Cotignola in the Romagna, by name Giacomo or Muzio Attendolo. He was born June 10, 1369, and followed the trade of woodcutting, but left it to join a band of condottieri, and by intelligence and courage rose to high position. Joanna II of Naples made him Constable of that Kingdom, and as such he fought bravely against the Aragonese. He afterward

entered the service of Pope Martin V and became a Roman count. His natural son, FRANCESCO SFORZA (1401–66), succeeded him in command of the band of mercenaries, devised an improved system of tactics, and won a widespread reputation. His greatest patron, Filippo Maria Visconti, Duke of Milan, conferred upon him the hand of his daughter Bianca, with Cremona and Pontremoli as a dowry, and the promise of succession to the duchy. (See VISCONTI.) Sforza, by a combination of force and stratagem, obtained his elevation to the Dukedom of Milan (1450) three years after the death of his father-in-law. He established his authority over all Lombardy and several districts to the south of the Po, and even Genoa came under his sway. His son, GALEAZZO MARIA SFORZA (1444–76), a monster of cruelty and debauchery, was assassinated (Dec. 26, 1476) at the porch of the cathedral of Milan. Galeazzo's son, GIANGALEAZO SFORZA (1469–94), succeeded under the regency of his mother, Bona of Savoy, who held the reins of government with a firm hand. In 1481 her brother-in-law, LODOVICO, surnamed the Moor, banished the Regent and assumed power. Lodovico summoned Charles VIII of France to his aid in 1494, but found his own power threatened and joined the league against the French. In 1499 he was driven from his duchy by the troops of Louis XII. In 1500 he made an ineffectual attempt to recover his possessions, was imprisoned, and carried to France, where he died in 1508. Lodovico was a patron of the arts and sciences. He gave his niece Bianca in marriage to the Emperor Maximilian I. Lodovico's eldest son, MASSIMILIANO SFORZA, regained the Duchy of Milan in 1512, but after the battle of Melegnano (1515), in which his Swiss auxiliaries were overwhelmed by Francis I, he abandoned his rights to the French for a pension of 30,000 ducats. His brother, FRANCESCO MARIA SFORZA (1492–1535), was put in possession of Milan after the defeat of the French at La Bicocca in 1522. His death marked the extinction of the main line of the house of Sforza, and the duchy was taken into the possession of Charles V. Consult Magenta, *Gli Visconti e gli Sforza* (Milan, 1883), and C. M. Ady, *History of Milan under the Sforza* (New York, 1907).

SFORZATO, sfôr-tsä'tô, or SFORZANDO (It., forced). In music, a term often abbreviated *sf*, used to indicate that the note or chord over or under which it is placed is to be played with strength and emphasis.

SGAMBATI, zgám-bä'tē, GIOVANNI (1843–1914). An Italian pianist and composer, born in Rome. He studied under Barbieri, Natalucci, and Aldega. His unusual pianistic ability attracted the attention of Liszt, who undertook to superintend the perfecting of his musical education. His first composition, a pianoforte quartet, was heard in 1866. In the same year he made his début as an orchestral conductor, in which capacity he was through life indefatigable in the cause of the German masters. His fame spread to Germany as well as throughout Italy, and in 1877 he was appointed principal professor of the pianoforte at the Academy of Santa Cecilia, Rome. In 1896 he founded the Nuova Società Musicale Romana. He was devoted to Wagner and his works, and it was the master's recommendation that induced Schott (Wagner's publisher) to bring out Sgambati's works. His compositions are strongly German in character and include a *Requiem Mass* (1896), three symphonies, overtures, piano concertos, chamber music, salon music, and several pieces for the organ. Consult A. de Angelis, *I musicisti italiani contemporanei: Giovanni Sgambati* (Turin, 1912).

SGANARELLE, zgå'nå'rĕl'. A character frequently appearing in Molière's comedies. In the *Cocu imaginaire* he is the title character. In the *Ecole des maris* he is the surly dupe of the play, cajoled by his ward, Isabelle. He is the aged hero of the *Mariage forcé* (q.v.), the father of Lucinde in *L'Amour médecin*, the valet of Don Juan in *Le festin de Pierre*, and the hero of *Le médicin malgré lui*.

SGRAFFITO, zgrå-fē'tô (It., decoration by scratches). A form of decoration which has existed in central Italy at least since the fifteenth century. The plastering on a wall is colored black or dark brown, and then a thin coat of lighter colored plaster is spread over this, and while the new coat is still damp it is scored deeply in scroll patterns and arabesques, which show dark on the light ground. The term is extended to denote imitations in painting of this process, and in Italy many house fronts have been decorated in this way since the middle of the nineteenth century. Scratched decoration of rough and soft pottery is also included under this head. It was common in the prehistoric ages in all the Mediterranean lands, as many pieces so adorned have been found in Syria, Cyprus, and elsewhere; also in old Peruvian and Central American art.

'SGRAVENHAGE, s'KRÄ'ven-hä'ge. The Dutch name for The Hague (q.v.).

'SGRAVESANDE, sgrä'*ve*-sän'de. See GRAVESANDE.

SHABATZ or **ŠABAC,** shä'bâts. A town of the District of Podrinye, Servia, on the Save, 38 miles west of Belgrade (Map: Balkan Peninsula, B 2). The town has an old castle dating from the fifteenth century, a college, and a library. Its exports are honey, cereals, prunes, and live stock. It was the scene of important fighting in the Great War in Europe (q.v.). Pop., 1900, 12,072.

SHACKLETON, shăk"l-ton, SIR ERNEST HENRY (1874–1922). A British naval officer and Antarctic explorer, born at Kilkee, Ireland. Serving in the commercial marine and as an officer of the Royal Naval Reserve, he was lieutenant on the British National Antarctic expedition commanded by Capt. R. F. Scott (1901–04), with whom he made a record southing (lat. 82° 17′ S.). After service (1903–06) as an officer of the Royal Scottish Geographical Society, Shackleton financed, organized, and commanded the Antarctic expedition of 1907–09, distinguished for remarkable achievements, without fatalities, from its base in McMurdoo Sound. The mountains to the west were explored, Mount Erebus ascended, and the south magnetic pole reached—for the first time—and located in lat. 72° 25′ S., long. 155° 16′ E. Shackleton personally led the southern sledge party, which reached lat. 88° 23′ S., long. 162° E., within 97 miles of the pole, surpassing his predecessors by 366 geographical miles. Among other discoveries were coal, etc., an enormous glacier, eight mountain ranges and 100 peaks, the outward journey ending on the vast polar plateau, about 11,000 feet above the sea. In 1914–16 he was engaged in an expedition for the purpose of crossing the continent of Antarctica from Coats Land (long. 20° W.)

to McMurdoo Sound (long. 165° E.). He was knighted in 1909 and was made C.V.O. the same year. He received the highest honors from the geographical societies of America, Belgium, France, Great Britain, Holland, and Italy. His expedition of 1907–09 has been described by him in *The Heart of the Antarctic* (Philadelphia, 1909).

SHAD (AS. *sceadda*, shad). An important anadromous fish of the herring family (Clupeidæ, q.v.) and genus *Alosa*. Shad grow to a larger size than herring and differ from them in the absence of teeth in the jaws and in the form of the cheek, this being deeper than long in the shad. Shad live in the sea, but ascend rivers in the spring to spawn. They have their spawning beds, but the eggs may be extruded anywhere promiscuously in the water. One female averages about 30,000 eggs, though as many as 156,000 have been obtained. The eggs sink to the bottom, where they hatch in from three to five days, varying with the temperature. During their stay in the rivers shad take very little if any food. In the sea they swim with their mouths open, straining the minute organisms from the water which passes through their gills. In early days these fish were extremely abundant, but their popularity as a food fish, together with the disturbance of their natural spawning grounds and the pollution of the rivers by factory refuse, have made great reductions in their number. Because they are so prolific, however, and because of the artificial incubation of the eggs by government hatcheries, the supply has been fairly maintained. The catch along the Atlantic coast of the United States in 1910 amounted to 5,800,000 shad, with a value to the fishermen of $1,900,000. (See Fish Culture; Fisheries.) The common shad of the Atlantic coast is *Alosa sapidissima*. It attains a weight of three pounds on the average, but sometimes weighs from 12 to 14 pounds. Since about 1885 shad have been planted in streams of California, where they have become abundant and now extend northward to southern Alaska. The common shad of Europe is *Alosa vulgaris*, and an important species in Chinese waters is *Alosa reevesii*. Consult G. B. Goode, *Fishery Industries* (sec. i, Washington, 1884), and the publications of the United States Commission of Fish and Fisheries. See Allice; Plate of Herring and Shad; and of Food Fishes, accompanying Fish as Food.

SHADBUSH, June Berry, or American Service Berry (*Amelanchier canadensis*). A

AMERICAN SERVICE BERRY.

shrub or small tree of the family Rosaceæ, common to Canada and the northern United States, which bears a sweet red or purple fruit, varying in size from that of a currant to a morello cherry and ripening from June to August. The larger growing forms are seldom cultivated, although dwarfs are common. It is also cultivated for its early appearing flowers. It is easily propagated from cuttings or layers in the fall or by seeds or grafts in the spring. The name "shadbush" is said to be applied to this and other species because the blossoms appear about the time shad ascend the rivers of the eastern United States. See Service Berry, and for illustration, Plate of Spiræa, etc.

SHADDOCK. A term applied in the United States and the West Indies to various forms of *Citrus decumana* or *grandis* other than the grapefruit (q.v.), usually a large pale-yellow fruit, more or less pear-shaped, with thick rind, spongy, bitterish, greenish-white, subacid pulp. In Asia, Malaysia, and various tropical countries where the shaddock is known as pummelo, pompelmous, and by variants of these names, certain globose forms, pink-fleshed forms, and varieties of good flavor also occur. The tree is tenderer than the orange and the fruit is not of commercial importance. It is sometimes used as stock for other citrus fruits.

SHADE, or **SHADOW.** In art a quality of painting, the opposite of light, with which it is generally contrasted. The treatment of light and shade in painting is usually known as chiaroscuro (q.v.).

SHAD FLY. See May Fly.

SHADOW. See Light.

SHADOW PLAY. A dramatic representation by means of shadows cast by puppets upon a screen. It is, therefore, a modification of a puppet show (see Puppet), though the same thing in principle has sometimes been accomplished by shadows of living persons moving behind a screen or by the shadows of their hands upon the wall. The usual essentials for a shadow play consist of an opening like that of a doorway to serve as a scene, covered with a thin white screen upon which a light from behind casts the images of the puppets. These are worked by concealed persons, who also supply the dialogue. The earliest evidences of this kind of entertainment are in China; it is known also in Japan, in Java, and especially in Mohammedan countries, Karagös (Black Eye) being among the Turks a well-known conventional character in this miniature drama. Southern Germany was one of the early homes of this as of other puppet shows. Introduced into France in the eighteenth century, shadow plays became a recognized amusement of the royal children at Versailles, and later a little theatre was established in the galleries of the Palais Royal in Paris in which, with its successors, down to the end of the Second Empire, pieces continued to be given in this way. In more recent years the shadow play has been revived on an elaborate scale in some of the cabarets of the Montmartre quarter in Paris. At the Chat Noir, particularly, under the direction of Henri Rivière, several very complicated dramas have been presented, among them being *L'Epopée* of Caran d'Ache. Consult: Pisko, *Licht und Farbe* (Munich, 1876); Champfleury, *Le musée secret de la caricature* (Paris, 1888); Jacob, *Erwähnungen des Schattentheaters in der Welt-literatur* (Berlin, 1906).

SHADRINSK, shä'drênsk. A district town in the Government of Perm, east Russia, situated on the river Isset, 383 miles southeast of

Perm (Map: Russia, K 3). It has a number of distilleries and exports grain, animals and animal products, and cloth. Pop., 1910, 14,000.

SHAD'WAIT'ER. The round or Menominee whitefish. See WHITEFISH.

SHAD'WELL, THOMAS (c.1642–92). An English dramatist and poet laureate, now little remembered except as the MacFlecknoe of Dryden's satire. He was born in Norfolk and was for a time a student at Cambridge. Entered at the Middle Temple in London, he found the law little to his taste and left it for a period of foreign travel and the pursuit of literature. In 1668 he brought out his first comedy, *The Sullen Lovers.* This was a success and was followed by a series of similar ones, many of them written either in avowed imitation of Ben Jonson or in more or less free adaptation from the French. Perhaps his best-known piece is *The Squire of Alsatia,* which was produced in 1688. His collected plays were brought out in four volumes by his eldest son in 1720. With Dryden he was at first on friendly terms, but an unfortunate satiric effort of Shadwell's brought down upon him the scathing ridicule of *MacFlecknoe,* where his name is forever fixed in the judgment of old Flecknoe:

> "Shadwell alone, of all my sons, is he
> Who stands confirmed in full stupidity.
> The rest to some faint meaning make pretense,
> But Shadwell never deviates into sense."

He is the Og, too, of *Absalom and Achitophel.* Nevertheless, when Dryden had to resign the laureateship in 1688, Shadwell was his successor, and his comic wit, though coarse, was often vigorous and effective. He died Nov. 19, 1692; according to report, from an overdose of opium. Consult the biography in Shadwell's *Works* (already referred to); also A. W. Ward, *History of English Dramatic Literature to the Death of Queen Anne* (rev. ed., 3 vols., New York, 1899), and W. F. Gray, *Poets Laureate of England: Their History and their Odes* (London, 1914).

SHAFIITES, shā'fī-īts. See MOHAMMEDAN SECTS.

SHAFROTH, shăf'rŏth, JOHN FRANKLIN (1854–1922). An American lawyer and legislator, born at Fayette, Mo. He graduated at the University of Michigan in 1875 and was then admitted to the bar. In 1879 he moved to Denver, where he became prominent as a lawyer. From 1888 to 1892 he was city attorney, and in 1894 he was elected to Congress as a Silver Republican. In 1896 he became a Democrat, was reelected as Representative, and served until 1904, when he refused to occupy his seat because his last reëlection was alleged to be fraudulent. Shafroth was a progressive and able Governor of Colorado from 1908 to 1912, and in 1913 he was elected United States Senator by an overwhelming majority. In the Senate he became known as a radical Democrat.

SHAFT (AS. *sceaft,* shaft). 1. In architecture, the body of a column between the base and capital. In Egyptian and Greek architecture the shafts were built up of several drums, while the Roman, early Christian, and Byzantine architects favored monolithic shafts. Mediæval builders employed built-up shafts, except in the case of slender columns clustered about a central built-up core. These slender shafts were sometimes, especially in England, monoliths of black marble. Very long shafts were sometimes in two or three lengths, with molded bands at the junctions. The columns in the jambs of Lombard, Norman, and Gothic doorways and windows are called jamb shafts or nook shafts. They formed one of the most decorative features of mediæval architecture. Shafts resembling Roman candelabra were used in the early Renaissance in Italy, Spain, and France. See COLUMN.

2. In nontechnical usage the term is often applied to any column-like object, such as an obelisk or stele, and may be used to designate the entire column, including base and capital.

SHAFT. An opening of varying cross sections carried down into the earth, primarily for the purpose of hoisting ore or other mineral products to the surface. In addition the shaft may also serve the purpose of ventilation, pumping, or ladder way. Where the rock is soft and treacherous it is necessary to support the walls of the shaft with brick, wooden timbers, iron, or latterly steel or concrete, either plain or reënforced. In some mines the shaft is divided into several sections, one to hoist the ore, a second to convey the pumping and compressed-air pipes, and a third for the ladders. Shafts are usually vertical or nearly so; when an opening is inclined at a low angle from the horizontal, it is termed a slope. Shafts are often carried to great depths, as in the case of the Red Jacket Mine of the Calumet and Hecla Company at Lake Superior, 4900 feet deep. Consult: M. C. Ihlseng, *Manual of Mining* (4th ed., New York, 1911); id., *Handbook of Mining Details* (ib., 1912); R. Peele, *Mining Engineers' Pocket Book* (ib., 1916). See MINING, especially the section on *Hoisting.*

SHAFT DRIVE, IN MOTOR VEHICLE. See MOTOR VEHICLE.

SHAF'TER, WILLIAM RUFUS (1835–1906). An American soldier. He was born at Galesburg, Mich., and was at first a farmer. Soon after the outbreak of the Civil War he enlisted. He was made colonel of volunteers in April, 1864, and in 1865 was brevetted brigadier general. In 1866 he entered the regular service. In 1897 he was promoted brigadier general and commanded the Department of California until the beginning of the Spanish-American War, when, as major general of volunteers, he was put in command of the first expedition to Cuba. At the head of about 16,000 men he landed at Daiquiri, Cuba, June 21, 1898, and advanced towards Santiago. On July 1 his forces carried the heights of El Caney and San Juan and before the end of the month had possession of Santiago and the entire eastern end of the island. After the war Shafter commanded the Department of the East until 1899, when he resumed his old post as commanding general of the departments of California and Columbia. In 1901 he was retired with the rank of major general in the regular army. The authorized biography of Shafter was written by Charles A. Weissert in 1916.

SHAFTESBURY, shăfts'bĕr-ĭ, commonly called SHASTON. A very ancient town of England, a municipal borough in Dorsetshire, 19 miles southwest of Salisbury (Map: England, D 5). It was the Caer Palladwr of the Britons and was famous as the seat of a Benedictine abbey, founded by King Alfred in 880, whither Edward the Martyr's body was translated in 980 and where Canute died (1035). Pop., 1911, 1873. Consult Mayo, *Municipal Records of Shaftesbury* (Sherborne, 1891).

SHAFTESBURY, EARLS OF. A noble Eng-

lish family. ANTHONY ASHLEY COOPER, the first Earl (1621–83), was born at Wimborne St. Giles, Dorsetshire, July 22, 1621, his father being John Cooper and his mother Anne Ashley, daughter of Sir Anthony Ashley. He entered Exeter College, Oxford, in 1637, but took no degree. He had a seat in the Short Parliament, when not quite of age, and espoused the cause of royalty, but later became an active parliamentary leader. When he saw the Restoration was inevitable he took so prominent a part in bringing back Charles II that he was created Baron Ashley. He was a member of the Cabal ministry and in 1672 was made Earl of Shaftesbury and Lord Chancellor. The next year he supported the Test Act in favor of Protestantism and lost his office, delivering up the Great Seal with a threat: "It is only laying down my gown and putting on my sword." He declined to resume his office and headed the parliamentary opposition. In 1677 he protested against prorogation and was imprisoned in the Tower for a year. On his release he took advantage of the false affidavit of Titus Oates and used the panic thus caused to initiate a persecution of Catholics. He had five Catholic peers sent to the Tower charged with implication in a Jesuit conspiracy and 2000 other persons imprisoned. Stafford was a later victim (1680). Upon the fall of Danby, Shaftesbury became President of the Council and introduced an exclusion bill in Parliament. When it became known that he wished to give the succession to the King's bastard son, the Duke of Monmouth, he was deserted by his colleagues, and Parliament was prorogued. It was in this session that he secured the passage of the Habeas Corpus Act. Shaftesbury was dismissed from the Council (1679). In 1681 he was arrested and thrown into the Tower on a charge of high treason. The charge was thrown out by the grand jury, and he was released. He threw himself further into the conspiracies until in December, 1682, he had to flee to Holland, where he died in a few months. Consult his *Life* by W. D. Christie (2 vols., London, 1871) and by H. D. Traill in the series of "English Worthies" (ib., 1886).

ANTHONY ASHLEY COOPER, third Earl of Shaftesbury, philosopher and moralist, grandson of the first Earl, was born in London, Feb. 26, 1671. In 1683 he was sent to Winchester School, and three years later he traveled in Germany, France, and Italy. After three years he returned to England and studied philosophy. In 1711 he went to Naples on account of his health and died there Feb. 15, 1713. His important writings were collected by himself and published as *Characteristics of Men, Manners, Opinions, Times* (1711; enlarged ed., 1714). The enlarged edition contains, among other things: *A Letter Concerning Enthusiasm* (1708); *Sensus Communis* (1709); *The Moralists: a Philosophical Rhapsody* (1709); *A Soliloquy* (1710). Shaftesbury is one of the most important of English moralists. His significance lies in the emphasis he placed on the social feelings and instincts. Against Hobbes he emphasizes the important part played by the natural affections (= social and benevolent impulses) in securing happiness for the individual. Virtue consists in the harmony between the natural and the self-affections, while the unnatural affections tend to the good (= happiness) neither of the individual nor of the race. Virtue is a matter of our own instincts; it is independent of religion. Consult: Gizycki, *Die Philosophie Shaftesburys* (Leipzig, 1876); Thomas Fowler, *Shaftesbury and Hutcheson* (London, 1882); James Martineau, *Types of Ethical Theory* (3d ed., Oxford, 1898); Leslie Stephen, *Essays on Freethinking and Plain Speaking* (new ed., New York, 1905).

ANTHONY ASHLEY COOPER (1801–85), seventh Earl of Shaftesbury, was an eminent philanthropist. Born in London, educated at Harrow and Oxford, he entered the House of Commons in 1826, remaining a member until 1851, when he succeeded his father in the peerage. In 1834 he was made Lord of the Admiralty, but soon after his election to Parliament he had entered upon what was to be his real life's work—reform of social and legal abuses. He first devoted himself to the question of the insane, whose pitiful condition stirred him to unceasing activity until he obtained complete reform of the Lunacy Acts. He next gave his attention to the passage of a 10-hour factory bill, accomplishing this in 1847, having made a study of labor conditions in Lancashire. In 1842 he also alleviated by Act the hardships of coal-mine workers, abolishing the system of apprenticeship and forbidding employment of women and young children in the pits. Shaftesbury interested himself also in the London chimney sweeps and carried the celebrated Climbing Boys Act. He devoted much time to studying the slums of London, was instrumental in the erection of the so-called Ragged Schools, and was for 39 years chairman of the Ragged School Union. His Lodging House Act of 1851 was a great step forward in improving the housing of the poor. He caused the construction of a large number of model tenements at Battersea and erected model cottages on his own estate. With the masses of the people Shaftesbury enjoyed immense popularity. He died Oct. 1, 1885. His speeches, with an introduction by himself, were published in 1868. Consult Edwin Hodder, *Life and Work of the Seventh Earl of Shaftesbury* (3 vols., London, 1886), and Sir Spencer Walpole, in *Studies in Biography* (New York, 1907).

SHAFT GOVERNOR. A form of steam-engine governor in which the mechanism for regulation is attached to or forms part of the crank shaft of the engine. (See GOVERNOR.) Such governors are very directly influenced by any changes in speed because of the absence of intervening mechanism or linkage between the revolving shaft and the valve elements. They are usually designed to vary the throw of the eccentric or crank which moves the valve, diminishing the valve movement with increase of speed above the normal, and causing an earlier cut-off. They are compact and powerful, and are safer for high-speed engines than governors driven by belts or gears. Acceleration due to centrifugal force is resisted by powerful springs in all designs, so that the initial tension of such springs acts as the load in the loaded gravity governor.

SHAFTING. A series of bars or rods, supported on such suitable bearings as will secure correct alignment and coupled at their ends, of sufficient cross section to transmit power by turning without deformation by torsional stresses. The section of the bars is usually cylindrical, although square shafts are used for special cases. Pulleys or gear wheels are secured to the shaft by keys or set screws, so that a turning of the wheel by any source of power shall compel the revolving of the shafting and

all the wheels attached to it. The shafting units are of turned steel or of cold-rolled steel. The couplings in the simplest and oldest form are flanges, keyed to the end of the shaft and having their opposing faces bolted together. Shafting is made in 12 or 16 feet lengths, and its bearings should be only 8 or 10 feet apart. Above 250 feet in length the losses from friction due to its weight make shafting less efficient than other systems of transmission. Flexible shafting is used in dental engines and to drive portable tools such as drills or polishing wheels. It may consist of chains of special forms of link, enveloped in a flexible casing, or of spiral coils of wire wound in opposite directions, so that the coils cannot collapse or unwind. Squared shafting is used where the wheels which it is to drive and turn must be capable of lengthwise shifting of position while they turn.

SHAG. A cormorant (q.v.), especially *Phalacrocorax carbo*. See Plate of Fishing Birds.

SHAGBARK. See Hickory.

SHAGREEN, shȧ-grēn′ (Turk. *sāghri*, shagreen, back of a horse). A variety of leather made from the skin of the shark or some related selachian, or from portions of the skins of horses, asses, camels, and oxen. These strips are prepared by soaking in water and currying, and when in the proper condition they are laid on the ground, and the seeds of *Chenopodium album* are sprinkled over them; a board or piece of felt is then placed on the seeds, and by pressure the hard seeds are forced deeply into the skin, which is then hung to dry. When dry the seeds are removed by shaking, and the skin pared nearly but not quite as low as the bottom of the depressions caused by the seeds. After this the skin is again soaked, and the parts compressed by the seeds now rise up and form elevations, which are increased by washing in a solution of salt. The last operation is dyeing them various colors, green being the favorite one. Owing to the difference of texture produced by the operations of compressing by the seeds, paring, etc., the color is taken irregularly, and when dyed green the material somewhat resembles malachite in appearance when dried and polished. Consult A. Watt, *Leather Manufacture* (London, 1906).

SHAHAN, shā′an, Thomas Joseph (1857–). An American Roman Catholic theologian and educator, born at Manchester, N. H. He was educated at Montreal College (1872) and at the American College (1878–82) and the Propaganda (S.T.D., 1882) in Rome and was chancellor and secretary of the diocese of Hartford in 1883–88. After studying at the Roman Seminary (J.U.L., 1889) and at the University of Berlin (1889–91) he served as professor of Church history and patrology at the Catholic University of America (1891–1909) and then as rector. He became domestic prelate to the Pope (1909), and was president of the Catholic Educational Association in 1909–14 and of the National Conference of Catholic Charities in 1910–14. His publications include: *The Blessed Virgin in the Catacombs* (1892); *Giovanni Battista de Rossi* (1900); *The Beginnings of Christianity* (1903); *The Middle Ages* (1904); *The House of God and Other Addresses and Studies* (1905); *St. Patrick in History* (1905).

SHAHAPTIAN STOCK. A group of cognate tribes formerly occupying the country upon the waters of the Snake River and the middle Columbia in Idaho, Washington, and Oregon, from the Bitter Root Mountains to the Cascade Range and from about the 45th to the 47th parallel. The principal tribes are the Nez Percé or Shahaptin, Klikitat, Palûs (Paloos), Topinish, Umatilla, Wallawalla, Warmsprings (Tenino, Tyigh, Des Chutes), and Yakima. In consequence of their central position and their natural enterprise the Shahaptian tribes became the recognized trading intermediaries between the Plains tribes east of the Rocky Mountains and fishing tribes of the lower Columbia and coast. Two of the most famous Indian leaders in the history of the Columbia region, Joseph and Smohalla (q.v.), are of this lineage. They number now in all 4391 on reservations in Idaho, Washington, and Oregon, the Nez Percé leading with 1259. Consult H. J. Spinden, in *American Anthropological Association, Memoirs*, vol. i, part ii, vol. ii, part iii (Lancaster, Pa., 1905–08).

SHAHJAHANPUR, shä′jū-hän′pōōr. The capital of a district of the same name in the United Provinces of Agra and Oudh, India, 102 miles north by west of Lucknow on the Deoha River (Map: India, D 3). It has a military post, several old mosques, and mission schools. The city is engaged in sugar refining and distilling. Pop., 1901, 76,458; 1911, 71,778. Shahjahanpur dates from 1647 and came under English control in 1801.

SHAH JEHAN, je-hän′ (Pers., king of the world) (?–1666). The fifth of the Mogul emperors of Delhi. He was the second son of Jahangir and as Prince Khurram distinguished himself by victories over the Rajputs (1614), the Mohammedan states of the Deccan (1616), and the Afghans at Kandahar. In 1622 Shah Jehan rebelled against his father when the latter, after the sudden death of his eldest son, Khusru (probably murdered by Shah Jehan), declared his third son, Parviz, heir to the throne. He sacked Agra and ravaged Bengal, but was defeated by the forces of Jahangir and sought refuge in the Deccan (1624). On the death of the Emperor in 1627 Shah Jehan, who had been pardoned by his father, succeeded in overcoming his rivals and ascended the throne at Agra (1628), marking his accession by the murder of all the princes of his house whom he could seize. During his reign he alienated the native Hindu rajputs from himself and destroyed the Portuguese settlement of Hugli, near the present Calcutta. He lost Kandahar (1649) and most of the Kabul territory, but, on the other hand, he gained the State of Ahmednagar (1636) and made Bijapur and Golconda in the Deccan pay him tribute. This period was the zenith of the Hindu Mohammedan architecture. Shah Jehan built at Agra the Moti Masjid, or Pearl Mosque (1653), as well as the famous Taj Mahal (q.v.), and founded the modern city of Delhi (q.v.), which is still called Shahjahanabad by the Indian Mohammedans. He also constructed the celebrated peacock throne at Delhi, valued by Tavernier at £6,000,000. The closing years of his reign were embittered by the struggle of his four sons for the throne. Two of them, Aurungzebe (q.v.) and Murad, made common cause, marched on Agra, and in 1658 imprisoned Shah Jehan, who died in 1666. Consult Stanley Lane-Poole, *Mediæval India under Mohammedan Rule (712–1764)* (London, 1903), and James Burgess, *Chronology of Modern India* (Edinburgh, 1913).

SHĀH-NĀMAH, -nä′mȧ. See Firdausī.

SHAHRASTANI, shä′rȧs-tä′nē, Abu'l Fath

Muhammad ibn Abd al Karim al Sharastani (1071–1153). The compiler in Arabic of a philosophic history of the religious sects of the world. He was born at Shahrastan, Persia, and after traveling returned home about 1120 and died there. His great work, *Kitabu'l milal wa'l nihal*, is scientifically arranged and is an impartial and careful study of all the various sects and religions known to him, including Judaism and Christianity and the Asiatic neighbors of Islam. His account of the perplexing Mohammedan sects is especially valuable, while his observations upon alien religions, such as Christianity, Zoroastrianism, Manichæism, and Sabæanism, are based upon exact information. The text was edited by Cureton, *Book of Religious and Philosophical Sects* (London, 1842–46), and was translated by Haarbrücker (Halle, 1850–51). Consult Brockelmann, *Geschichte der arabischen Literatur* (Weimar, 1898–1902), and A. A. Nicholson, *A Literary History of the Arabs* (New York, 1907).

SHAIRP, shârp, John Campbell (1819–85). An English teacher and author, born at Houstoun, Scotland. He was educated at Glasgow University and at Balliol College, Oxford; was an assistant master of Rugby (1846–57), assistant to the professor of Latin at St. Andrews (1857) and professor of Latin (1861–68), principal of the United College, St. Andrews (1868–77), and was appointed in 1877 and again in 1882 professor of poetry at Oxford. Among his stimulating books are: *Studies in Poetry and Philosophy* (1868), which discusses Coleridge, Wordsworth, and Keble, and shows Shairp as a critic of breadth and discrimination; *Culture and Religion* (1870), a work of considerable popularity, in which a spiritual nature in man is insisted upon to render his life intelligible; *The Poetic Interpretation of Nature* (1877), which deals with the varied treatment of nature in poetry and acutely sets forth the respective limitations of poetry and science; *Life of Burns* (1879), wherein a sharp distinction is made between the poet's character and his literary work; *Aspects of Poetry* (1881), treating several poets from Burns to Newman; *Sketches in History and Poetry* (posthumous, 1887). In 1864 he published a volume of poems entitled *Kilmahoe and Other Poems*. Consult W. A. Knight, *Principal Shairp and his Friends* (London, 1888).

SHAKE. See Trill.

SHAKERLEY. See Tyldesley-with-Shakerley.

SHAKERS, shāk'ẽrz. The name commonly applied to the members of the Millennial church, or the United Society of Believers, a communistic society having branches in New York, Massachusetts, New Hampshire, Connecticut, Maine, Ohio, Kentucky, Georgia, and Florida. They say that they were originally a sect of Quakers and were derisively called Shaking Quakers because of their movements of the body in religious meetings. The Shaking Quakers appeared in England about 1747, were organized under the leadership of Jane and James Wardley, and were joined later by Ann Lee (q.v.), of Manchester, who claimed to be Christ in his second reincarnation and who came to America in 1774 with seven of her converts and established a small church at Niskayuna, near Watervliet, N. Y. Ann Lee died in 1784, and the society was placed upon a communistic basis in 1787. A religious revival in 1779–80 brought to the society a large number of converts, and it grew steadily in wealth and importance. The Shakers now have 17 communities, the larger divided into several families, the members of which vary from only a few to 100 or more. In 1887 they numbered about 4000 members; an estimate for 1915 is 500. From the economic standpoint they have been unusually successful, but seem less so in recent years.

In origin the society is a religious community and may be said to rest upon "the belief in the revelation of Christ's second appearance in Ann Lee." The fundamental principles of the sect, that the root of human depravity is found in the "disorderly" or natural relation of the sexes, and that in God exists the maternal as well as the paternal nature, are believed to have been revealed to Ann Lee. She also foretold and sanctioned the communistic order of living, which has now become of equal importance with celibacy, nonresistance, and the equal rights of women in the simple creed of the Shakers. They neither condemn nor oppose marriage for the ordinary or "generative" world, and they "freely admit that the private family is necessary and must always exist," but they assert the possibility of attaining a higher or angelic order of existence to which virginity is a prime requisite, and they further hold that the virgin life is indispensable in organized communism, because the family relationship necessarily implies private centres of affection and economic interest incompatible with successful communism. In their religious ceremonies they worship neither Christ, Ann Lee, nor any other person, but "the highest good, wherever it may be found"; and they hold that the Bible, while of incalculable value to the human race, contains traditional biographies and records which are purely secular. Their form of worship is thus described in an official pamphlet: "We sing and march to tunes of different measure and move our hands in a gathering form, expressive of one's desire to obtain the treasures of the spiritual realm. Sometimes we are led to go forth in the dance, which seems to quicken body and soul and kindle anew the fire of truth. We use some stronger means to banish the elements of worldly bondage by shaking, as an expression of our hatred to all evil; are bold in denouncing idolatry, pride, deceit, dishonesty, and lust. Unlike the outside churches, all the members are free to speak their religious convictions and to exercise in any good gift. Our songs, hymns, and anthems are original, most of them written under the power of inspiration; they are the simple expressions of an earnest hope and a living faith and are well adapted to our manner of devotional exercises." A fundamental part of their religious creed and practice is the confession of sin in the presence of a witness, men and women confessing to an elder of their own sex. They believe in a "continuous revelation," and this makes their doctrine as well as their practice plastic and adaptable to changing conditions and has enabled them to indorse and defend land nationalization, spiritualism, and other modern radical movements. Except in the fundamental doctrines mentioned above they are tolerant and broad-minded. "Our only demands," says the *Plain Talks upon Practical Christian Religion*, "are the successful prosecution of a pure life after the Christ pattern, believing and realizing that all other features of Christian communism will immediately succeed."

The Shakers regard ostentation, luxury, and

private property as sinful and unchristian. They live in groups or "families." The government of the family is parental. The supreme authority is vested equally in an elder and eldress, or two of each sex when the order is full. Temporal affairs are managed by an equal number of deacons and deaconesses acting in counsel with the elders. The two sexes eat in the same halls, and social intercourse is free and open. Healthful living is regarded as a religious duty, and much attention is given to hygiene; the result is a low death rate and a large proportion of centenarians. Their income is derived from farming, small manufactures, and the education of children. The latter, however, is in many cases gratuitous and undertaken in the hope of replenishing their membership.

The Shakers were the first to establish a communistic settlement in the United States, and their historical significance rests upon the fact that for more than a century these settlements have been successfully maintained. The oldest and largest community is situated at Mount Lebanon, N. Y., 25 miles southeast of Albany, and is recognized as "the central executive of all the Shaker societies."

Bibliography. Green and Wells, *Summary View of the Millennial Church* (Albany, 1848); F. W. Evans, *Shakers' Compendium* (New York, 1859); id., *Autobiography of a Shaker* (Mount Lebanon, 1869); H. L. Eads, *Shaker Theology* (Albany, 1879); Blinn, *Concise History of the Shakers* (East Canterbury, N. H., 1894). Most prominent among periodical publications, all of which have ceased to appear, are the *Shaker Manifesto* (1871–90) and the *Shaker and Shakeress*. Consult also: Noyes, *History of American Socialisms* (Philadelphia, 1870); Charles Nordhoff, *The Communistic Societies of the United States* (New York, 1875); R. T. Ely, *Labor Movement in America* (new ed., ib., 1905); J. P. MacLean, *Bibliography of Shaker Literature* (Columbus, 1905); White and Taylor, *Shakerism: Its Meaning and Message* (ib., 1905); W. A. Hinds, *American Communities* (Chicago, 1908).

SHAKESPEAR, shāk'spēr, JOHN (1774–1858). An English Orientalist, born at Lount, Leicestershire. He was educated in the schools of the vicinity and then sent by Lord Rawdon (afterward Marquis of Hastings) to London to study Arabic. About 1805 he was appointed to a professorship in the Royal Military College, Marlow, and after the establishment at Addiscombe of a training school for cadets by the East India Company he was professor of Hindustani there from 1809 to 1829. His works comprise: *Hindustani Grammar* (1813; 6th ed., 1855); *Dictionary of Hindustani and English* (1817; 4th ed., of 1849, containing an English-Hindustani dictionary); *Muntakhabat-i-Hindi: Selections in Hindustani* (2 vols., 1817–18); *Introduction to the Hindustani Language* (1845).

SHAKESPEARE, shāk'spēr, WILLIAM (1564–1616). An English poet and dramatist, born at Stratford-on-Avon in the County of Warwick in April, 1564. He was baptized on April 26 (O. S.), and, as it was a common practice to christen infants when three days old, the tradition which makes his birthday the 23d (May 3 as dates are now reckoned) is generally accepted. Of a family of four sons and four daughters, William was the third child, but eldest son. His father, John Shakespeare, who had been a farmer in the neighboring village of Snitterfield, came to Stratford about 1553 and, in Sidney Lee's words, "set up as a trader in all manner of agricultural produce," in which capacity he probably performed the functions of butcher and glover which tradition assigned to him. William's mother, Mary Arden, belonged to a younger branch of a good old Warwickshire family and inherited a considerable estate from her father. John Shakespeare was evidently shrewd, energetic, ambitious, and public-spirited. He made money and was popular with his fellow townsmen. After passing through the lower grades of office he was elected alderman and in 1568 became high bailiff or mayor. In 1556 he bought two houses in Stratford. John Shakespeare, like his fellows in the town council, appears to have been a lover of the drama. When he was high bailiff in 1569, licenses for local performances were granted to two companies of traveling players. John very likely took the five-year-old William to see them act.

When William was seven years old he doubtless entered the Stratford Grammar School. The masters of the school in Shakespeare's boyhood were university men of at least fair scholarship and ability, as we infer from the fact that they rapidly gained promotion in the Church. The studies were mainly Latin, with writing and arithmetic and perhaps a mere smattering of other branches. A little Greek was sometimes taught in the grammar schools, and this may have been the case at Stratford. Ben Jonson credits Shakespeare with "small Latin and less Greek," which some critics interpret as equivalent to "no Greek," but Ben was not inclined to overstate Shakespeare's classical attainments. Whatever the boy may have learned in the Stratford school during the six or seven years he probably spent there, we may be quite certain that it was all the regular schooling he ever had, and we have no reason to suppose that he kept up his classical studies after leaving school. Attempts have been made to prove Shakespeare a scholar, but a careful examination of his works proves the contrary. His quotations from Latin authors are confined to those then read in school and are such as a schoolboy might make. In one instance at least the form of the quotation shows that it was taken from Lilly's Latin Grammar (then used in all English schools) and not from the original play of Terence. He makes frequent mistakes in classical names, which a learned man like Bacon, e.g., could never have been guilty of. Bacon, indeed, gives some of these very names correctly in passages that have been quoted to illustrate the resemblance between his works and Shakespeare's; they really show that the dramatist was ignorant of what the philosopher was familiar with. The training in the grammar school was, however, an insignificant part of Shakespeare's education in the broader sense. The poet is born, not made, says the ancient saw; but the development of his genius largely depends upon where and under what influences he lives in his childhood and in later years. Shakespeare's life was almost entirely spent in Stratford and London, and in both homes he was eminently fortunate. He was born and lived for 20 years in the country—in the heart of rural England. His manhood was passed in the city—in what was then the greatest of cities. Stratford was within the limits of the Forest of Arden, which still retained enough of its primitive character to render the youth familiar with woodland scenery and life and to

cultivate his love of nature, which was that of a child for its foster mother. It was here also that he got the minute knowledge of the practical side of country life which appears in his works. Volumes have been written on the plant lore and garden craft of the dramatist, and they prove his love of the country and his keen observation of natural phenomena and the agricultural practice of the period. Others have shown that he understood hawking and hounds and had a very wide and loving knowledge of many English birds and other animals. His acquaintance with angling is apparent in some of his works.

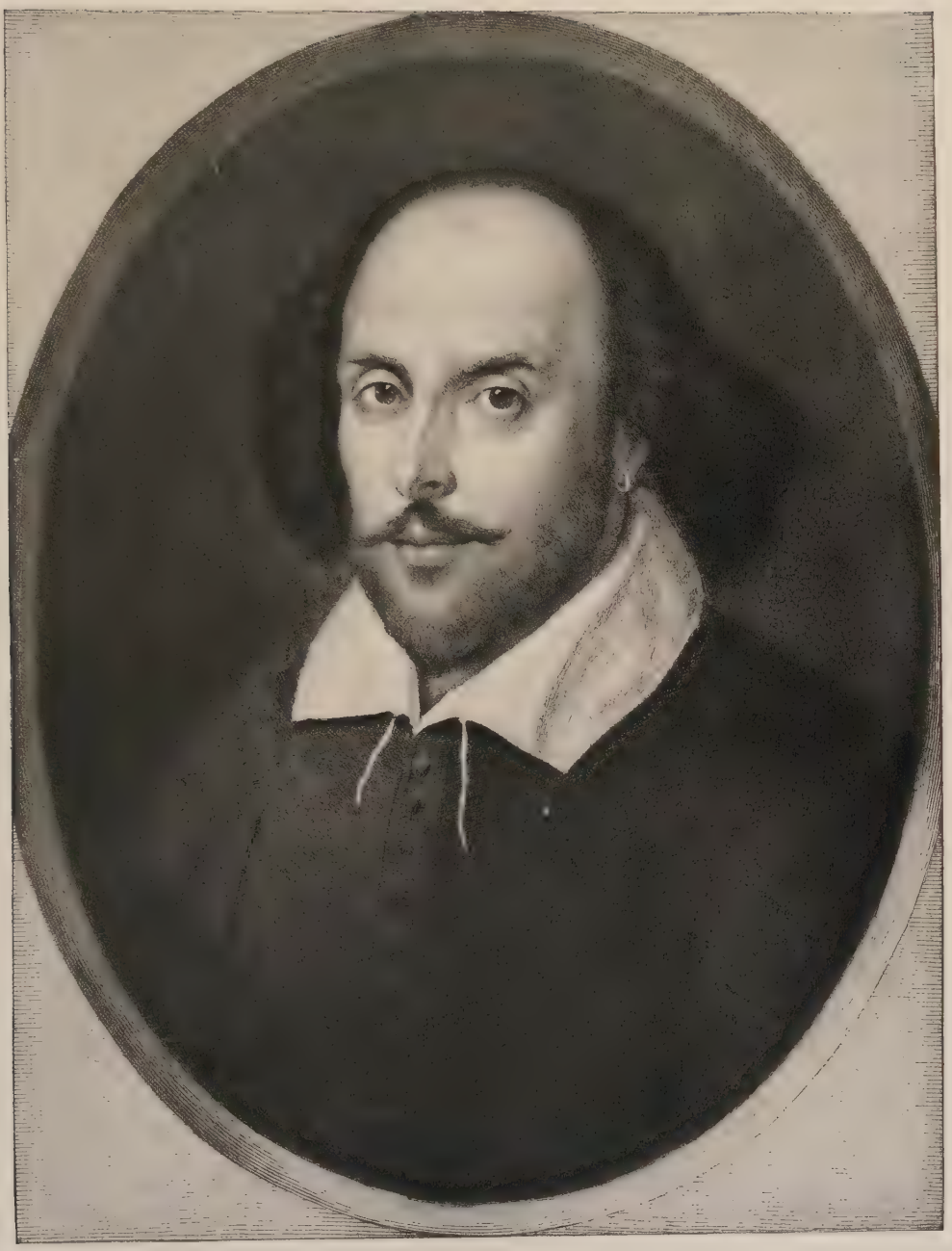
The legendary lore of the district was equally stimulating and inspiring to a poet. Warwickshire was eminently a field of romance and old heroic story and the scene of many an ancient ballad. Guy of Warwick was a foremost hero in this popular poetry, and his gigantic spectre still haunts the scenery of his traditional exploits. Shakespeare in his boyhood was familiar with the stories about this half-mythical personage, and he recalled them in later life when he put allusions to Colbrand, the big Saracen whom Guy conquered and slew, into the mouths of certain characters in his plays. Warwickshire was also prominent in the history of the English drama. Coventry was renowned for the religious plays performed by the Greyfriars of its great monastery and kept up, though with less pomp, even after the dissolution of their establishment. It was not until 1589 that these pageants were entirely suppressed, and Shakespeare may from time to time have been a witness of them. His allusions to characters in these old plays (as, e.g., to Herod in *Hamlet* and *The Merry Wives of Windsor*, and to the "lost souls" in *Henry V*) prove that he knew them by report, even if he had not seen them. Historical plays, not biblical in subject, were also common in Coventry before the dramatist was born. *The Nine Worthies*, which he burlesques in *Love's Labour's Lost*, was acted there before Henry VI in 1455. The original text of the play has been preserved, and portions of Shakespeare's travesty seem almost like a parody of it. The play performed at Stratford in 1569, which must have been of this religious or historical type, was the beginning, so far as the town records show, of theatrical performances in Stratford, but in succeeding years they were frequent. Of course the young Shakespeare witnessed them, and we can surmise how they fired his imagination and fostered his inborn taste for the drama.

For some time after leaving school the boy may have helped his father in his trade. In 1577 John Shakespeare was beginning to have bad luck in his business, and William, then 13 years old, may have been taken from school for work of some kind. The tradition that he was bound apprentice to a butcher and later ran away to London is improbable. Another tradition makes him an attorney's clerk for a time, and the many references in his works to the technicalities of the law have led Lord Campbell and other specialists to believe that he must have studied law somewhat thoroughly. But Judge Allen, of the Supreme Court of Massachusetts, in his *Notes on the Bacon-Shakespeare Question* (1900), has shown that such legal allusions are equally common in contemporary dramatists, and that Shakespeare, instead of being uniformly accurate in these matters, as Lord Campbell and others have assumed, is often guilty of mistakes which a lawyer or student of law would never make. This may be regarded as the final word on the question of the supposed legal attainments of the dramatist.

The first indisputable fact in Shakespeare's life after leaving school is that of his marriage, which occurred when he was between 18 and 19 years old. The bride, Anne Hathaway, was about eight years older, as she died Aug. 6, 1623, at the age of 67. She was the daughter of a farmer in Shottery, a village about a mile from Stratford. The marriage was probably solemnized early in December, 1582, and in one of the neighboring parishes, the records of which have been lost. The date is approximately fixed by a bond authorizing the marriage "with once asking of the bans," which is still extant in the Episcopal archives of Worcester, the diocese to which Stratford and Shottery belonged. This bond is dated Nov. 28, 1582. A daughter was born to the young couple the next May. She was baptized with the name Susanna on Sunday, May 26, 1583, and twin children, Hamnet and Judith, followed early in 1585 (baptized Feb. 2, 1585), or about two months before their father was 21.

Of his life from the date of his marriage to his departure for London nothing further is positively known, and the most important tradition of the period is that of his poaching in Sir Thomas Lucy's park at Charlecote, near Stratford. The strongest argument in its favor is based on the evidence in the plays that Shakespeare had a grudge against Lucy and caricatured him as Justice Shallow in *2 Henry IV* and *The Merry Wives of Windsor*. The reference to the "dozen white luces" in the latter play (i, 1, 16–22) is palpably meant to suggest the three luces, or pikes, in the arms of the Lucys, and the manner in which the dialogue dwells on the device indicates that some personal satire was intended. How Shakespeare managed to support his family at this time is doubtful. His father's fortunes were still dwindling, and there were four younger children to be taken care of: Gilbert (born 1566), Joan (1569), Richard (1574), and Edmund (1580). Ann, born in 1571, had died in 1579. The waning of John Shakespeare's fortunes was probably due to the general depression in business that seems to have affected Stratford at that time.

The date of Shakespeare's leaving Stratford for London cannot be definitely fixed. The poaching adventure is supposed to have occurred in 1585, and if it drove him from Warwickshire, it was probably in the autumn of that year. The birth of the twins in January, 1585, and the difficulty he must have had in supporting his increasing family are also in favor of that date. It was in that year, moreover, that he came of age, which may have led him to take this serious step in the hope of bettering his fortunes. It is generally agreed that he left Stratford in 1585 or 1586. What friends or what employment he found on reaching London we do not know. According to a tradition that cannot be traced further back than 1750, though it is said to have been originally related by Sir William Davenant a century earlier, his first employment in the metropolis was in holding horses at the door of the theatre. Whether it is true or not, we know that the young man soon got into one of the two theatres then established in London—perhaps, as tradition says, in the humble capacity of "prompter's attendant, whose employment it was to give the performers notice to be ready to enter" on the stage. Doubtless



SHAKESPEARE

FROM AN ETCHING, BY LEOPOLD FLAMENG, OF THE CHANDOS PORTRAIT IN THE NATIONAL PORTRAIT GALLERY, LONDON

his abilities were soon recognized and led to something higher. It could not have been long before he had begun his career as an actor in small parts and had worked his way up more or less rapidly, but for seven years after he went to London, or from 1585 to 1592, we have no information whatever about him, and tradition is silent except with reference to the very beginning of the period. At last in 1592 we get a definite reference to him in the literature of the time, and we are indebted for it to the envy and spite of a disappointed and dying playwright, Robert Greene, who in the autumn of that year published a little book entitled *Greens Groatsworth of Wit, bought with a Million of Repentance*. After referring to certain dramatists of the day, Greene turns to the actors and says: "Yes, trust them not, for there is an upstart crow, beautified with our feathers, that, with his *Tygers heart wrapt in a Players hide*, supposes he is as well able to bombast out a blanke verse as the best of you; and being an absolute *Johannes Factotum*, is in his owne conceit the only Shake-scene in a countrie." The epithet of Shake-scene obviously refers to Shakespeare, and the passage implies that he was both actor and author and perhaps, as some believe, plagiarist also. The italicized quotation is obviously a parody of "O tiger's heart wrapp'd in a woman's hide" in *3 Henry VI* (i, 4, 137), an old play in which Greene is assumed to have had a hand and which was revised by Shakespeare. In December, 1592, Henry Chettle, who had published Greene's pamphlet for him, brought out his own *Kind Harts Dreame*, in which he refers to Shakespeare thus: "Myselfe have seene his demeanor no less civill than he excient in the qualitie he professes; besides, divers of worship have reported his uprightness of dealing, which argues his honesty, and his facetious [felicitous] grace in writing, that approves his art." It is evident from Greene's sneer and Chettle's apology that Shakespeare in 1592 was already an actor of some prominence, that he had begun his career as an author by revising old plays for a new lease of life on the stage, and that he was gaining reputation and making friends.

All three parts of *Henry VI* were plays that Shakespeare retouched for the stage at the very beginning of his dramatic career, but the second and third parts have unquestionably a larger proportion of his work than the first. *Titus Andronicus* is another play which probably has a similar history and which bears some slight traces of his hand. If he was the author of this bloody and revolting tragedy, as a few critics have assumed, it must have been written before he had found his true self. It is far more probable that when he first attempted entirely original work it was in comedy, and that *Love's Labour's Lost* was the play. It was doubtless written as early as 1591, if not two or three years earlier. The first extant edition appeared in 1598, when the title-page informs us that it had been "newly revised and augmented." *The Two Gentlemen of Verona* and *The Comedy of Errors* appear to have followed immediately; and the first draft of the poet's first tragedy, *Romeo and Juliet* (excluding *Titus Andronicus*), belongs to the same period, the play in its present form being a revised and enlarged edition. *Richard III*, the first of the English historical plays which was entirely the work of Shakespeare, naturally follows the trilogy of *Henry VI* and was probably written in 1592 or 1593. *Richard II* was produced soon after *Richard III*, though, like that play, it was not printed until 1597. Both plays appeared without the author's name, which was added the next year in second editions of both. *A Midsummer Night's Dream* belongs in this group of early comedies, of which it was in all probability the last, 1595 being the probable date of composition.

The breadth of Shakespeare's literary tastes and aspirations in this prentice period of his career is shown by the fact that, just when his reputation as an actor and a dramatist was becoming established, he published two long narrative poems, *Venus and Adonis* and *Lucrece*, the former in 1593 and the latter in 1594. The popularity of the *Venus and Adonis* led to the issue of a second edition in 1594, and at least 10 more editions appeared in the next 16 years. Probably there were others, as only single copies are extant of several of the known issues. Nothing was known of the fourth edition until a copy was discovered in 1867, and a single copy of the twelfth has come to light more recently. Of the *Lucrece*, eight editions are known, but it is unlikely that these complete the list. Both poems are dedicated to the young Earl of Southampton, who was a liberal patron of men of letters and particularly interested in the drama.

In the dedication of *Venus and Adonis* Shakespeare calls the poem "the first heir of my invention," i.e., the first product of his imagination. This does not prove that it was written before any of the plays, but may only mean that it was his first distinctively *literary* work, plays being then regarded as not included in literature properly so called. Some critics, however, take the expression in its literal sense, believing that the poem was first written when the author was a very young man, perhaps even before he went to London. If Shakespeare did not become an author until 1590, the period of his literary apprenticeship covers at most five years, or until the end of 1594; and during this time he revised more or less thoroughly *Titus Andronicus* and the three parts of *Henry VI* and wrote at least the seven original plays already enumerated and two long poems. And all this time he was actively engaged in his profession as an actor. The earliest definite notice of his appearance on the stage is of his playing in two comedies before Elizabeth at Greenwich Palace in December, 1594. During the next six years (1595–1600) Shakespeare completed the series of English historical plays (not including *Henry VIII*, his part in which was done at least 10 years later) and wrote most of his best comedies and *Julius Cæsar*. All or nearly all the *Sonnets* are probably to be included in this period. *King John* is generally assigned to 1595, internal evidence indicating that it immediately followed (if it did not precede) *Richard II*. The two parts of *Henry IV* followed in 1596 or 1597 and *Henry V* in 1598. *The Merry Wives of Windsor*, which tradition says was written at the request of Elizabeth, who desired to see Falstaff in love, appears to have come between *2 Henry IV* and *Henry V*. *The Merchant of Venice* is mentioned in a list of Shakespeare's plays in Francis Meres's *Palladis Tamia*, published in September, 1598; it was, according to Sidney Lee's conclusion, acted in 1594; it was printed in 1600. The list just referred to includes all the plays mentioned above, except the trilogy of *Henry VI*. It does not include *The Taming of the Shrew* (an

adaptation of an anonymous play called *The Taming of a Shrew*, published in 1594), which in its present form cannot well have been later than 1597 and may be a year or two earlier. Some good critics identify it with the *Love's Labour's Won*, mentioned by Meres, which the majority believe to have been an early draft of *All's Well that Ends Well*. In the closing years of the century, between the summer of 1598 and the end of 1600, Shakespeare, after finishing the English historical plays (except *Henry VIII*), returned to comedy and wrote his three most brilliant works in that line, *As You Like It*, *Much Ado About Nothing*, and *Twelfth Night*. The order of their composition is uncertain, but *Twelfth Night* is almost unanimously reckoned the last of the series. *Julius Cæsar* is alluded to in Weever's *Mirror of Martyrs* (printed in 1601, but written two years before), and other evidence leaves little doubt that the play was produced in 1599—Sidney Lee, however, fixing the date of production as 1601. It was very popular, and many allusions to it are found in the literature of the time, according to one of which it was far more successful than Ben Jonson's Roman plays, *Catiline* and *Sejanus*.

Of Shakespeare's personal history between 1592 and 1600 few facts are known. In 1596 his only son, Hamnet, died and was buried on August 11 at Stratford. During the Christmas holidays his theatrical company performed twice before Elizabeth at Whitehall. In the spring of 1597 he made his first investment in real estate by the purchase of New Place, a mansion with about an acre of land in the centre of Stratford. In 1596 John Shakespeare, doubtless by his son's advice and at his expense, applied to the College of Heralds for a coat of arms; but, though the petition was approved in October of that year, the negotiations were not then concluded. In 1599 John made a new application to the College of Heralds, in which he refers to the action taken on that of 1596, and also requests that he and his son may be allowed to quarter on the coat the arms of the Ardens of Wilmcote, his wife's family. The heralds granted the coat, but substituted the arms of the Ardens of Alvanley in Cheshire, apparently because these belonged to a younger branch of the family, from which Mary Arden was descended. John Shakespeare died in 1601, two years afterward, and there is no evidence that either he or his son used the Arden arms. William did use the Shakespeare arms as tricked by the heralds, and he may have felt that they had become honorable enough without displaying the connection with the Ardens. By 1599 William Shakespeare had made a name for himself that needed no lustre borrowed from ancestral rank. He went to London in 1585 or 1586 a penniless adventurer, but in 1597 he had gained reputation and made money as actor and author and could invest his surplus income in the purchase of the best house in Stratford. Besides defraying the expenses in obtaining the coat of arms there is evidence that he helped to restore the fallen fortunes of his father. He repaired New Place and added other lands to the estate. In 1602 he spent the large sum of £320 to purchase 107 acres of land near Stratford and also bought a cottage and garden in the town.

The actor's business was then lucrative enough to excite the envy of pamphleteers, and if the actor got a share in the theatre or its profits, as Shakespeare did in 1599 when the Globe Theatre was built, it added materially to his income.

Shakespeare's receipts as an actor before 1599 were probably £100 a year, to which perquisites from court performances might add £15 or so. His returns from his work as a dramatist would be much smaller. Before 1599 the prices paid for plays ranged from £6 to £15, the most that is known to have been paid. To this a slight gratuity was added if the play was very successful, and the author sometimes had a share in the receipts of a benefit on a second production. Shakespeare's income from the revision and writing of plays up to 1599 can hardly have been more than £20 a year, which, added to £110 or £115 from acting, would make his entire income £130 or £135, equal to from seven to ten times that amount in modern money. The quarto editions of his plays published at this time and afterward were evidently all piratical ventures which yielded him nothing. From the successive editions of his poems—the only works printed under his personal supervision—he may have received something, but we have no means of estimating how much. According to Rowe's biography (1709) Shakespeare once received a gift of £1000 from his generous patron, the Earl of Southampton. The amount (equal to at least £7000 or $35,000 now) is undoubtedly exaggerated, but Southampton would be likely to make some substantial acknowledgment of the compliment paid him in the dedications of the *Venus and Adonis* and *Lucrece*. The only epistolary correspondence now extant in which Shakespeare was a party and the only letter addressed to him have reference to business matters. In January, 1598, Abraham Sturley writes from Stratford to his brother-in-law, Richard Quiney, who was in London, where the poet then was, suggesting that he obtain help from Shakespeare in certain business for the town, and later Quiney himself wrote to Shakespeare, asking the large loan of £30. This letter somehow got into the Stratford archives. Thomas Quiney, who married the poet's daughter Judith, was a son of Richard Quiney.

We do not know in which of the London playhouses of 1585 (the Theatre and the Curtain) Shakespeare found employment. In 1592 the Rose was opened on the Bankside, and that was doubtless the scene of his early successes as actor and dramatist. In 1594 he was connected with another new theatre at Newington Butts, and afterward he returned to the Theatre and the Curtain. The Theatre was torn down in 1599, and most of the materials were used in the erection of the Globe on the Bankside, which from that time appears to have been the only house with which he was regularly connected. At the Blackfriars Theatre (established in 1596) Shakespeare played a leading part in Jonson's *Every Man in his Humour* in September, 1598, after having secured the acceptance of the play, which the manager was on the point of refusing (Rowe). On Twelfth Night and Shrove Sunday, 1600, the Globe company acted before Elizabeth at Richmond Palace, and on December 26 at Whitehall. In the following March they played at Somerset House before Lord Hunsdon and some foreign ambassadors. At Whitehall in the Christmas holidays of 1601–02 they presented four plays before the Queen. They also acted at Richmond on Candlemas Day, Feb. 2, 1603, less than two months before the death of Elizabeth (March 24, 1603). James arrived in London on May 17, and 10 days afterward he granted a license to Shakespeare and his company to per-

form in London and the provinces. In December, 1603, when the King was visiting the Earl of Pembroke, one of Shakespeare's patrons, at Wilton, the company played before the distinguished party there assembled; in the following Christmas holidays they acted several times at Hampton, and on Candlemas Day in the same palace before the Florentine ambassadors. On March 15, 1604, when James made his formal passage from the Tower to Westminster, Shakespeare and the eight other actors to whom the royal license had been granted in 1603 marched in the royal train, and each was presented with four and a half yards of scarlet cloth, the usual dress allowance of players belonging to the household. They were now termed the King's servants and took rank at court among the grooms of the chamber.

Of the parts played by Shakespeare himself we have little information. According to a credible tradition he personated Adam in *As You Like It*, and Rowe says that he acted "the Ghost in his own *Hamlet*." John Davies of Hereford says that he "played some kingly parts in sport." In the list of "the principal actors in all these plays," prefixed to the Folio of 1623, his name is placed first, but perhaps only because he was the author of the plays. There is no reason to suppose that he was ever a star in the histrionic firmament of the period.

If Shakespeare's *Sonnets* are entirely or largely autobiographical, as the great majority of critics and commentators believe, they belong in all probability to the years 1593–98; and of all the puzzles concerning the man and his works none has been the subject of more speculation and controversy. What we really know about the *Sonnets* can be stated in a few sentences. The earliest known reference to them is in Meres's list of the poet's works already mentioned, in which they are called "his sugred Sonnets among his private friends." The next year (1599) two of them (138 and 144) were printed in *The Passionate Pilgrim*, a piratical booklet containing a few other poems known to be Shakespeare's, with some falsely attributed to him. In 1609 the entire collection of 154 sonnets was published by Thomas Thorpe, with the following dedication:

TO . THE . ONLIE . BEGETTER . OF .
THESE . INSVING . SONNETS .
MR. W. H. ALL . HAPPINESSE .
AND . THAT . ETERNITIE .
PROMISED .
BY .
OVR . EVER-LIVING . POET .
WISHETH .
THE . WELL-WISHING .
ADVENTVRER . IN .
SETTING .
FORTH .

T. T.

At the end of the volume *A Lover's Complaint* was printed for the first time. In 1640 the *Sonnets* (except 18, 19, 43, 56, 75, 76, 96, and 126), rearranged under various heads, were reprinted, with the pieces in *The Passionate Pilgrim* and other poems. The first complete reprint of the *Sonnets*, after the edition of 1609, was in the collected edition of Shakespeare's poems, published by Lintott in 1709. So much for facts about which there is no dispute. The question whether the edition of 1609 was authorized or supervised by Shakespeare has been much discussed, but it appears to have been definitely settled (by Dr. Rolfe) by one little peculiarity in the printing of the 126th sonnet, if sonnet it be called. It has but 12 lines, and Thorpe (or his editor), assuming that a couplet had been lost, completed the normal 14 lines by two blank ones inclosed in marks of parenthesis, thus:

( )
( )

Shakespeare could not have done this, and Thorpe would not have done it if he had been in communication with Shakespeare or any agent of his. The piece is not an imperfect sonnet of Shakespeare's pattern, but consists of six rhymed couplets, and the sense is apparently complete. Another important question, not so easily settled, is whether the *Sonnets*, entirely or in part, are autobiographical or are merely poetical exercises dealing with imaginary persons and experiences. Editors and critics generally believe that most if not all of the poems, to quote what Wordsworth says of them, "express Shakespeare's own feelings in his own person," or, as he says in his sonnet on the sonnet, "with this key Shakespeare unlocked his heart." Browning, quoting this, asks: "Did Shakespeare? If so, the less Shakespeare he"; to which Swinburne replies: "No whit the less like Shakespeare, but undoubtedly the less like Browning."

To whom is the dedication addressed and what does it mean? If Shakespeare had nothing to do with Thorpe's venture, the dedication is Thorpe's own, as it purports to be. But in what sense was "Mr. W. H.," whoever he may have been, "the onlie begetter" of the *Sonnets?* Begetter may mean, in the language of the time, either the person to whom the poems owed their birth, and to whom they were originally addressed, or the one who collected and arranged them for Thorpe. Most critics take the word in the former and more familiar sense, but others argue plausibly for the second meaning. If the latter view be correct, the identity of "Mr. W. H." is of slight interest; but if he was the poet's patron and involved in the supposed personal revelations, the question is very important. The only theories concerning him that are worthy of serious consideration are that he was William Herbert, Earl of Pembroke, and that he was Henry Wriothesley, Earl of Southampton, to whom Shakespeare dedicated *Venus and Adonis* and *Lucrece;* and to Herbert and his brother Philip, Earl of Montgomery, as two patrons of the dramatist, the Folio of 1623 was dedicated by the player editors. The weight of critical authority in favor of the two theories is about equal. According to both, the great majority of the *Sonnets* are personal and were not intended for publication. The first 126 (or such of these as are personal) are supposed to be addressed to one man ("Mr. W. H."), and the remainder to one woman, the "dark lady," with whom the poet and that man were entangled. This woman cannot be positively identified. Various attempts have been made to find an allegorical, mystical, or philosophical meaning in the *Sonnets*, and "Mr. W. H." has been supposed to represent the poet's Ideal Self, or Ideal Manhood, or the Spirit of Beauty, or the Reason, or the Divine Logos, and the "dark lady" to be Dramatic Art, or the Catholic church, or the Bride of the Canticles, "black but comely." More than one critic has assumed that "W. H." stands for "William Himself," and the entire series has been supposed to be addressed to Queen Elizabeth. The attempts

to identify the mysterious man, and also the woman, of the *Sonnets* do not now rest, and may-hap never will rest, on sure foundations.

A Lover's Complaint, published with *Sonnets* in 1609, is written in the same seven-lined stanza as *Lucrece*, but internal evidence indicates that it was later than that poem. The title-page of the 1709 edition of the *Poems* refers to it as "A Lover's Complaint of his Angry Mistress," but the lover is a girl who has been betrayed by a deceitful youth. *The Phœnix and the Turtle* is the only other poem by Shakespeare not already mentioned. It must have been written before 1601, when it was printed with Chester's *Love's Martyr*, together with poems by Marston, Chapman, and Ben Jonson.

After the plays already considered we come to a group of comedies so called, that are comedies only in name or because they have not a tragical ending. They are *All's Well that Ends Well*, *Measure for Measure*, and *Troilus and Cressida*—"one earnest, another dark and severe, the last bitter and ironical." (Dowden.) If *All's Well* is a later form of the *Love's Labour's Won* in Meres's list of 1598, the revision was probably made in 1601. *Measure for Measure* is supposed to have been written in 1603 or early in 1604. *Troilus and Cressida*, first published in 1609, may have been written about the same time and revised between 1606 and 1609. These plays appear to form a natural group and indicate that Shakespeare's interest was changing from comedy to tragedy, but it is not necessary to assume that they were written or revised in immediate succession and apart from other work. Although in a sense they lead up to the period of the great tragedies, they partly belong to it. Of these tragedies *Hamlet* was undoubtedly the first, the earliest quarto edition having appeared in 1603. The next year a second quarto was published, claiming to be "newly imprinted and enlarged to almost as much again as it was." At least three other editions were printed before the publication of the Folio of 1623, in which the text varies considerably from that of the quartos. The precise relation of the texts to one another is a perplexing question. *Othello* was performed Nov. 1, 1604, before King James and was probably then a new play. *Macbeth* is mentioned in the manuscript *Diary* of Dr. Simon Forman, who saw it "at the Glob, 1610, the 20 of Aprill," but it is supposed to have been written in 1605 or 1606. *King Lear* was produced about the same time and may possibly have preceded *Macbeth*. *Antony and Cleopatra* and *Coriolanus* must have followed at no long interval, the date generally accepted for both being 1606–08.

The transition from the tragedies to the plays that follow is most remarkable. From that period of gloom and horror the poet emerges into the genial sunshine of *Cymbeline*, *The Tempest*, and *The Winter's Tale*. Inexorable retribution for sin is no longer the keynote of his dramas, but charity, forgiveness, reconciliation, benignity almost divine. Dowden aptly calls these last plays romances, and other critics have accepted the designation. "The dramas have a grave beauty, a sweet serenity, which seems to render the name 'comedies' inappropriate; we may smile tenderly, but we never laugh loudly as we read them." *Cymbeline* was probably a new play when Dr. Forman, as we learn from his *Diary*, saw it in 1610 or 1611, the undated entry certainly belonging to one of those years. *The Tempest* was believed by Campbell, the poet, to be the last of Shakespeare's plays, and Lowell also thought that in it "the great enchanter" was "bidding farewell to the scene of his triumphs," but most critics think that *The Winter's Tale* followed rather than preceded it. *The Tempest* was acted before King James at Whitehall, Nov. 1, 1611. *The Winter's Tale* was also performed there four days afterward, but Dr. Forman had seen it at the Globe on "the 15 of Maye" the same year, and there is evidence that the play was originally licensed in the latter part of 1610.

It is now generally agreed that certain of the plays included in the standard editions of Shakespeare are partly the work of other dramatists. The earliest plays of this class belong to the period of his dramatic apprenticeship, when he was employed by theatrical managers to revise or touch up old plays for reproduction on the stage. *Titus Andronicus* and the three parts of *Henry VI* have been already considered, as well as the somewhat later *Taming of the Shrew*, in which there is more of his own work. To these are to be added three plays of the latter part of his career, *Timon of Athens*, *Pericles*, and *Henry VIII*, in all of which he had a considerable share, though the critics differ in their explanations of the divided authorship. *The Two Noble Kinsmen* is another play which some good critics believe to be partly Shakespeare's and which is included in several of the more recent editions of his works. The title-page of the earliest edition (1634) asserts that it was "Written by the memorable Worthies of their time; Mr. John Fletcher and Mr. William Shakespeare." There can be no doubt of Fletcher's share in it, but the authorship of the other portions is uncertain. The critics are almost unanimous in deciding that *Timon of Athens* is partly Shakespeare's, but they disagree as to its probable history. Most of them believe that he laid the play aside or left it unfinished and that it was completed by an inferior writer. Others think that he revamped an earlier play, parts of which he retained with slight alteration. Internal evidence indicates that his share of the work was done between 1606 and 1608. *Pericles, Prince of Tyre*, was first published in 1609, with Shakespeare's name on the title-page. It was not included in either the first or the second (1632) folio, but was reprinted with six plays wrongly attributed to Shakespeare in the third folio (1664) and the fourth (1685). Rowe put it in his editions (1709, 1714), but it was rejected by all other editors down to the time of Malone (1778, 1790), when it was restored, and it has kept its place ever since. The general opinion is that the first two acts and the prose scenes of the fourth act are not Shakespeare's. Whether he enlarged and reconstructed an earlier play, or some other writer or writers filled out an unfinished work of his, is a disputed question, but the latter seems to be the more reasonable hypothesis. The date of the play in its present form is probably 1607.

The Globe Theatre was burned June 29, 1613, when "filled with people to behold the play, viz., of Henry the Eighth," and the cause of the fire was a "peale of chambers," i.e., a discharge of small cannon. There can be little doubt that the play was Shakespeare's *Henry VIII*, in which, according to the original stage direction (iv, 1), we have "chambers discharged" at the entrance of the King to the "mask at the Cardinal's house." It was probably written or finished in 1612 or early in 1613. From the internal evi-

dence of metre and style it is quite clear that portions of the play are John Fletcher's, and Massinger may also have had a hand in it. The peculiarities of the metre were noted by Roderick as early as 1765, and about 1850 Spedding and Hickson, working independently, divided the play between Shakespeare and Fletcher in the same manner. Several years earlier Tennyson had pointed out to Spedding the resemblance to Fletcher's style in parts of the play, and it is an interesting fact that Ralph Waldo Emerson, in his lecture on Shakespeare (written several years before it was published in 1850), also noted the metrical evidences of two hands in *Henry VIII* and assumed that Shakespeare had worked upon an earlier play, written by a man "with a vicious ear." He adds: "See Wolsey's soliloquy and the following scene with Cromwell, where, instead of the metre of Shakespeare, whose secret is that the thought constructs the tune, so that reading for the sense will best bring out the rhythm, here the lines are constructed on a given tune, and the verse has even a trace of pulpit eloquence. But the play contains, through all its length, unmistakable traits of Shakespeare's hand, and some passages are like autographs." The passages that Emerson mentions are among those which Spedding and others decide to be Fletcher's. In explaining the double authorship the critics differ, as in other cases of the kind, but the majority believe that Fletcher completed an unfinished play by Shakespeare.

Besides the six spurious plays in the third folio, sundry others were ascribed to Shakespeare during his life by unscrupulous publishers, or afterward by injudicious critics. With somewhat better reason he has been supposed to have had a hand in the anonymous *Edward III*, and a few German critics think it is entirely his. It is difficult to ascribe the best portions of the play to any other dramatist of the time, but, as Furnivall says, "there were doubtless one-play men in those days, as there have been one-book men since."

During the latter half of 1606 the King's Company were playing in the provinces, but in December they had returned to London and in the Christmas holidays performed *Lear* before King James at Whitehall. The year 1607 was an eventful one in the poet's domestic annals. On June 5 his eldest daughter, Susanna, then 24 years of age (baptized May 26, 1583), was married at Stratford to Dr. John Hall, who attained to considerable eminence as a physician. In his early days Hall had traveled on the Continent and had become proficient in the French language. After he settled in Stratford his services and advice were sought by the best people there and elsewhere. He was summoned several times to attend the Earl and Countess of Northampton at Ludlow Castle, more than 40 miles off—no trifling journey in those days. After his death his medical case book, written in Latin, was translated and published in London (1657), and other editions appeared in 1679 and 1683. Dr. John Bird, the Oxford professor, says of the book: "The learned author lived in our own times, and in the County of Warwick, where he practiced many years and in great fame for his skill, far and wide. Those who seemed highly to esteem him, and whom, by God's blessing, he wrought those cures upon, you shall find to be, among others, persons noble, rich, and learned. And this I take to be a great sign of his ability, that such who spare not for cost . . . nay, such as hated him for his religion [he was an earnest Puritan] often made use of him." He died Nov. 25, 1635, at the age of 60. In December, 1607, Shakespeare's brother, Edmund, died in London and was buried in the church of St. Saviour's, Southwark, "with a forenoone knell of the great bell." His burial in the church was a mark of respect seldom paid to an actor, and the service in the morning was probably arranged in order that the members of the Globe Company might be able to attend it. Edmund was in his 28th year when he died. He had doubtless come to London and entered that theatre through his brother's influence, but of his record as an actor nothing is known. Elizabeth, the only child of the Halls, was baptized Feb. 21, 1608, the poet thus becoming a grandfather about two months before he was 44. She appears to have inherited his shrewd business ability, and she lived to be his last lineal descendant. She was married in 1626 to Thomas Nash, a citizen of Stratford, who had been a student of Lincoln's Inn, London. He died in 1647, and two years afterward his widow married Sir John Barnard of Abington Manor, near Northampton. She had no children by either husband. She died and was buried at Abington, Feb. 17, 1669, but no monument of any kind preserves her memory. In September, 1608, Shakespeare lost his mother, her burial being recorded on the 9th of the month in the parish register thus: "Mayry Shaxpere, wydowe." He was probably in Stratford at the time of the funeral and may not have returned to London until after October 16, when he was the principal godfather at the baptism of the William Walker (son of a local alderman) to whom in 1616 he bequeathed "20 shillings in gold."

In 1610 Shakespeare bought 20 acres of pasture land, adding them to the 107 acres bought in 1602. In February, 1612, the town council of Stratford resolved that plays were unlawful "and against the example of other well-governed cities and boroughs." Ten years later (1622) the King's Company were actually bribed by the council to leave the town without playing, the town records showing that six shillings were "payd to the Kings players for not playinge in the hall." This was doubtless out of deference to the King and not because it was Shakespeare's old company. In the neighboring town of Henley-in-Arden, in October, 1616, an order was unanimously passed that no other actors should have the use of the town hall. In the Stratford parish register, under date of Feb. 3, 1612, we find the record of the burial of "Gilbertus Shakespeare, adolescens." It probably refers to the poet's brother Gilbert, though (having been baptized Oct. 13, 1566) he would have been at the time more than 45 years old. In 1597 he was a haberdasher in London, but in 1602 he was in Stratford acting for his brother William in a conveyance of land, and in 1609 he was a witness to a local deed. There is no record of his marriage or of the birth of a son, and no son of Gilbert is mentioned in the poet's will. It is probable, therefore, that the "adolescens" was a slip of the scribe who made the entry from the sexton's notes. In February, 1613, Richard, probably the poet's last surviving brother (baptized March 11, 1574), also died. Joan (baptized April 11, 1569) was the only child of John and Mary Shakespeare, except William, who was now left. She married William Hart and survived her famous brother 30 years. Her husband died

in April, 1616, his burial taking place on the 17th, only eight days before that of the dramatist. In March, 1613, Shakespeare bought a house in London near the Blackfriars Theatre for £140, of which £60 remained on mortgage. He soon leased it to John Robinson, one of the persons that had violently opposed the establishment of the theatre.

The precise date of Shakespeare's return to Stratford to take up his residence at New Place is unknown, but it was probably as early as 1611, when his name appeared in a list of leading inhabitants of the town who raised a fund to promote the passage of a bill in Parliament "for the better repair of the highways." In the spring of 1614 we find that a Puritan preacher, who had been invited to the town by the corporation, was hospitably entertained at New Place. The town records read: "For one quart of sack and one quart of claret wine given to a preacher at the New Place, xx. d." Dr. Hall may have been living with Shakespeare at the time, and the preacher may have been invited to the house through his influence. On July 9, 1614, a fire at Stratford destroyed 54 houses, besides barns and other buildings. Fortunately New Place and the Shakespeare birthplace in Henley Street escaped the conflagration. In that same summer John Combe of Welcombe died, leaving £5 to Shakespeare in his will. In the autumn of 1614 the good people of Stratford were greatly excited by the attempt of William Combe, the squire of Welcombe, to inclose a large portion of the common fields near the town. The design was resisted by the corporation as likely to injure the agricultural interests of the town and materially to diminish the tithes. For this latter reason, if for no other, Shakespeare would naturally have been opposed to the scheme, but it seems probable that he was finally induced to favor it, being assured by Combe that his personal interests should suffer no detriment. It does not appear, however, that he took any active part in promoting the inclosures, which were finally prohibited by an order issued by Chief Justice Coke, March 27, 1615.

On Feb. 10, 1616, Judith, the poet's younger daughter, so charmingly idealized in Mr. Black's novel bearing her name, was married to Thomas Quiney, who was nearly four years her junior, having been baptized Feb. 26, 1589. He was an accomplished penman, and we may infer that he was acquainted with French from a motto in that language which he inserted in an official document. At the time of his marriage he was in business as a vintner and was patronized by the corporation and the leading citizens. In 1617 he was elected a burgess and in 1621–23 acted as chamberlain. In 1630 he retired from the council and, his business having fallen off, removed in 1652 to London, where he died a few years later. He had three sons, two of whom died in infancy and the third when 20 years old. Judith Quiney lived to the age of 76, surviving all the members of her family except her aunt, Joan Hart. Judith's marriage took place without a license, an irregularity for which a fine was imposed by the ecclesiastical court at Worcester. As no other cause is known or suspected, it is supposed that the nuptials were hastened on account of the failing health of her father.

He had made his will in the latter part of January, and from the original date and some other erasures in the document it appears to have been a corrected draft for the engrossed copy that was to be signed on the 25th of the month, but for some reason this was postponed. The draft was therefore laid aside until Shakespeare's condition became suddenly worse, when his lawyer was hurriedly summoned from Warwick, and, without waiting to make a regular transcript of the will, it was signed after a few more alterations had been hastily made. The most peculiar interlineation in the document, and one which has been much discussed as perhaps bearing on the question whether the poet was happy in his domestic relations, is that in which he leaves his widow his "second best bed, with the furniture." The first best bed was the one generally reserved for visitors and, being perhaps a family heirloom, would have descended to his eldest daughter as "undevisable property." There is no other reference to Mistress Shakespeare in the will, but she was amply provided for by virtue of her rights of dower, and such omission in a case of this kind was by no means uncommon in wills of the time. The gift of the bed, like many similar bequests in those old wills, was doubtless prompted by love and tender associations and not the insult it would otherwise have been —an insult which William Shakespeare on his deathbed could never have inflicted on the mother of his children. We have seen, moreover, that as soon as he began to be prosperous in London he bought the dilapidated New Place and, as fast as his means allowed, repaired the house, enlarged and improved the estate, and gradually made it the elegant and delightful home which must have been his ideal from the first and which he kept steadily in view for the 14 or more years before he returned to Stratford to enjoy it. That during all that time he looked forward to sharing that home with a wife whom he did not love is inconceivable.

Shakespeare died on Tuesday, April 23, 1616. According to a tradition, of which no mention occurs until about 50 years later, the poet in the latter part of March was visited by his friends Drayton and Ben Jonson, and at a "merry meeting" in a Stratford tavern the three "drank too hard, for Shakespeare died of a feavour there contracted." But the story probably had no other foundation than the popular notion of the time that fevers were generally due to some excess in eating or drinking. It is more likely, as Halliwell-Phillipps suggests, that Shakespeare's disease was induced by the wretched sanitary conditions of the immediate neighborhood of New Place—an explanation that would not have occurred even to the medical men of the time.

The funeral of "Will. Shakespeare, gent.," according to the parish register, occurred on April 25. His remains were deposited in the chancel of the church, that being the legal place for the interment of the owners of the tithes. The grave is covered with a slab bearing this inscription:

> "Good frend, for Jesus sake forbeare
> To digg the dust encloased heare;
> Bleste be the man that spares thes stones,
> And curst be he that moves my bones."

According to a tradition that dates back only to 1693, the lines were composed by the poet himself "a little before his death," but neither Dugdale in 1656 nor Rowe in 1709, when referring to the tomb, ascribes them to him. If he desired that the verses, or something to the same effect, should be put on the stone, it was

doubtless from fear that his bones might be removed at some time to the ancient charnel house that adjoined the chancel wall near his grave. The monument to Shakespeare in the chancel was erected before 1623, when it was mentioned in the verses by Leonard Digges in the folio published that year. It consists of an ornamental niche in which is a life-sized bust supposed to have been copied from a posthumous cast of the poet's face. It has no merit as a work of art, but as a portrait it must have been considered tolerable enough to be accepted by the surviving relatives. It was originally painted, the eyes being hazel and the hair and beard auburn, but in 1793, at Malone's instigation, it was covered with a coat of white paint, which remained until 1861, when the former coloring was restored. The only other portrait of the poet the authenticity of which is indisputable is the engraving by Martin Droeshout in the Folio of 1623, but though it has a general resemblance to the bust, it is equally poor in execution. A painted portrait in the Shakespeare Memorial Gallery at Stratford is believed by some experts to be the original of the Folio engraving, but it may have been copied from the latter. Shakespeare's widow survived him for more than seven years, the record of the burial being dated Feb. 8, 1623. Tradition says that she earnestly desired to be buried in the same grave with her husband, and her tombstone is beside his.

In 1916 Shakespeare's tercentenary was celebrated, by public meetings, plays, pageants, and publications, in many cities and centres of English-speaking countries.

The Folio of 1623, the first collected edition of Shakespeare's plays, was nominally edited by John Heming and Henry Condell, two of his friends and fellow actors, and was brought out by a syndicate of five publishers and printers. It contained 36 of the 37 plays commonly ascribed to the poet (*Pericles* being omitted), arranged as in many modern editions under the head of "Comedies," "Histories," and "Tragedies." Twenty plays appear in it for the first time, the other 16 having been previously printed in quarto form.

The typographical execution of the volume demands particular attention on account of the confused and contradictory descriptions given by some editors and commentators and the use that the Baconian heretics have made of it. According to the latter the Folio was edited by Bacon, being a collection of his plays carefully revised, corrected, and put into the shape in which he desired to hand them down to posterity. Shakespearean critics, on the other hand, assume that the Folio is just what it purports to be—a collection of plays by William Shakespeare, made seven years after his death by persons who had no skill in editing and who did little except to furnish the publisher with the best copies of the plays they could get, these being partly manuscripts used in the theatre and partly the earlier quartos that had also been used by the actors in learning their parts. These critics believe that internal evidence shows, beyond a doubt, that the Folio could not have had editor or editing in any proper sense. That the "copy" came from the theatre is proved by the fact that the names of actors are often found prefixed to speeches instead of the proper dramatis personæ, as, e.g., "Kemp" nine times and "Kem." thrice before Dogberry's speeches, and "Crowley" twice and "Couley" once before those of Verges in *Much Ado* (iv, 2). William Kemp and Richard Cowley were actors of the time in London. Some of the plays are divided throughout into acts and scenes; some into acts only; some partly divided or inconsistently divided; some not divided at all. Only seven plays have lists of dramatis personæ—in every instance at the end of the play. Words and phrases from foreign languages are wretchedly corrupted. Latin is printed with tolerable accuracy, though sometimes editors have been in doubt whether a phrase was Latin or French, but French, Spanish, and Italian are almost invariably misprinted, and often ridiculously so. In the *Merry Wives* (i, 4), e.g., "Ma foi, il fait fort chaud: je m'en vais à la cour—la grande affaire" (as corrected by Rowe) appears thus: "mai foy, il fait fort chando, Je man voi a le Court la Grand affaires," and "un garçon" as "oon garsoon." Verse is often printed as prose, and prose as verse; stage directions are made parts of the text, and vice versa. The punctuation is careless throughout and often absurd. In short there is hardly a possible typographical blunder or perversion of which we do not find frequent examples. Heming and Condell doubtless did the work as well as they could, but not as Shakespeare, if he had lived, would have done it or as Bacon, if the book had been his, would have done it. The player editors, indeed, seem to think that their task has been performed very creditably. In their preface, after referring to the quartos as "diverse stolne, and surreptitious copies, maimed and deformed by the frauds and stealthes of injurious impostors," they add: "even those are now offered to your view cur'd, and perfect of their limbes; and all the rest, absolute in their numbers [metre], as he conceived them." It has nevertheless been shown by careful examination and computation that the number of readings in the volume that are either clearly wrong or in the highest degree suspicious is about 20,000, and the number of typographical errors of all kinds in those readings and elsewhere must be many times 20,000. The second folio (1632) was a reprint of the first, with few changes for the better except (as Prof. C. Alphonso Smith, of the Louisiana State University, has shown in the Leipzig *Englische Studien* for December, 1901) in syntactical corrections. The third folio, a reprint of the second, with few variations of any value or interest, was first published in 1663. It was reissued the next year with seven plays added: *Pericles; The London Prodigal; The History of Thomas Lord Cromwell; Sir John Oldcastle; The Puritan Widow; A Yorkshire Tragedy; Locrine.* The fourth folio (1685) was a reprint of that of 1664 (including the seven plays just mentioned) with the spelling somewhat modernized, but no other change. After the publication of the fourth folio no collected edition of Shakespeare's works appeared until Rowe's (7 vols., octavo, 1709–10) was brought out. It was based on the text of the fourth folio. The poems were not included until the second edition (9 vols.) was issued in 1714. Rowe made some corrections in the text and modernized the spelling and pointing, besides inserting lists of dramatis personæ.

Among other complete editions of the eighteenth century and the early part of the nineteenth that have any critical value, the following may be mentioned: Pope's (6 vols., 1723–25; other editions appeared in 1728, 1735, 1768); Lewis Theobald's (7 vols., 1733; other editions

in 1740, 1752, etc.); Sir Thomas Hammer's (6 vols., 1744); Bishop Warburton's (8 vols., 1747); Dr. Samuel Johnson's (8 vols., 1765); Edward Capell's (10 vols., 1768); George Steevens's revision of Johnson's edition (10 vols., 1773; 2d ed., 1778); Isaac Reed's revision of the preceding (10 vols., 1785); Edmund Malone's (10 vols., 1790); Steevens's, with Boydell's illustrations (9 vols., 1802; in parts, 1791–1802); Reed's first edition with his name (21 vols., 1803; 2d ed., 1813); Alexander Chalmers's (10 vols., 1805); the Variorum of 1821, edited by James Boswell, from a corrected proof left by Malone (21 vols.). Since 1821 editions have rapidly multiplied, and the bulk of Shakespearean literature has vastly increased. See SHAKESPEARE-BACON CONTROVERSY.

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SHAKESPEARE-BACON CONTROVERSY. The antecedent improbability that any young man whose formal education had been only moderate would go up to London from the country towards the end of the sixteenth century and become the author of the greatest English dramas has led to a theory, now more than half a century old, that William Shakespeare (q.v.) did not write the plays that pass under his name. This theory, which in its positive

form has nearly always argued that Francis Bacon (q.v.) was the true author of the dramas, was first suggested by Joseph C. Hart, who expressed a doubt as to Shakespeare's authorship of them in his *Romance of Yachting* (1848), and was carried on in an article in *Chambers's Journal*, Aug. 7, 1852, and in a letter written to Lord Ellesmere by W. H. Smith in 1856 entitled *Was Lord Bacon the Author of Shakespeare's Plays?* In January, 1856, Miss Delia Bacon (q.v.) argued the same question in *Putnam's Monthly*, and in the year following she put forth the full Baconian argument in a volume entitled *The Philosophy of Shakespeare's Plays Unfolded by Delia Bacon*, for which Hawthorne wrote a noncommittal preface. In the following years probably more than 500 books and pamphlets have appeared contending for one variation or another of the theory that Bacon was the author of the plays. Among the best known of these books are *The Authorship of the Plays Attributed to Shakespeare*, by Nathaniel Holmes (1866), the edition of *Bacon's Promus of Formularies and Elegancies*, by Mrs. Henry Pott (1883), *The Great Cryptogram*, by Ignatius Donnelly (q.v.) (1887), *The Bi-Literal Cypher of Francis Bacon*, by Mrs. E. W. Gallup (1900), *The Bacon-Shakespeare Controversy*, by Lord Penzance (1902), and *The Shakespeare Problem Restated*, by G. G. Greenwood (1908). Although here and there a person of acute intelligence in one field or another has become an advocate of Bacon's authorship, scarcely any scholar reputably trained for judgment in the field concerned has ever been converted to the theory.

The contention that Shakespeare did not write the plays is based on (1) the unlikelihood that a moderately educated Stratford boy would develop so much genius and display so much learning as they exhibit and (2) the feeling that the knowledge we possess of Shakespeare's life is a strangely meagre record to be left about so great a man and is also insufficient to identify the man from Stratford with the author of the dramas. To the first point it may be answered that Shakespeare was about as likely to develop genius as was any other child born in England in 1564; that the learning shown in the dramas is neither more extensive nor more exact than would be possible for a man with a fair schooling who kept his eyes and ears open, mingled with men, and read good books; and that, on the other hand, the quality of genius and the kind of learning exhibited in the plays are most compatible with a mind not too highly seasoned by academic training. In answer to the second point it may be said that, meagre as is our information about Shakespeare's life, it is still more extensive than is our knowledge of the life of any other Elizabethan dramatist except Ben Jonson, who was autobiographically inclined, and that it abounds in direct testimony that the man from Stratford and the author of the plays are one. The contention that Bacon wrote the dramas has usually rested on the slender and precarious evidence of (1) a few passages in Shakespeare's works similar to passages in Bacon's, (2) certain supposed ciphers in the plays interpreted as cryptic signatures of Bacon, and (3) a single sentence in a letter written to Bacon by Sir Tobie Matthews at some date subsequent to January, 1621. The parallel passages consist of nothing more than phrases that were in common use, and it is easy to find as many phrases common to Shakespeare and to other authors of his time, or of other times, as can be found common to him and Bacon. The ciphers are so absurd as to have been repudiated by many of the more intelligent Baconians themselves. Each one of the ciphers tends to invalidate all the others, and either these cryptograms will not function at all without great violence to logic or they work so well as to demonstrate Bacon's authorship of books written before he was born or after he was dead. The sentence from Sir Tobie Matthews reads: "The most prodigious wit that I ever knew of my nation and of this side of the sea is of your Lordship's name, though he be known by another." There is nothing in the context or the words themselves to connect this sentence with Shakespeare, and there is reason to believe that Matthews was referring to the Jesuit Father, Thomas Southwell, whose real name was Bacon.

SHAKESPEARE SOCIETIES. Down to about the middle of the nineteenth century the criticism of Shakespeare had been mainly æsthetic and philosophical. For the purpose of illustrating Shakespeare and the literature of his time, J. O. Halliwell (afterward Halliwell-Phillipps) (q.v.), John Payne Collier (q.v.), and their friends founded in 1841 the first Shakespeare Society. Before its dissolution in 1853 it published 48 volumes. In spite of much careless editing these publications are of very great value. In 1874 F. J. Furnivall (q.v.), aided by a group of English scholars, set on foot the New Shakespeare Society, whose first publications on verse tests were epoch-making in the history of Shakespearean scholarship. On the celebration of the three hundredth anniversary of Shakespeare's birth at Weimar (April 23, 1864) the German Shakespeare Society (the Deutsche Shakespeare-Gesellschaft) was established. Since 1865 it has issued a year book (*Jahrbuch*), representative of the best German criticism. In 1885 the Shakespeare Society of New York was organized, with J. Appleton Morgan as its first president. Besides publishing its transactions it has issued the *Bankside Shakespeare* (20 vols., 1888–92), in which the text of the quartos is printed by the side of the text of the first folio (1623); and also the *Bankside Restoration Shakespeare* (1907). Among the many Shakespeare societies may be mentioned that of Birmingham, England, and that of Philadelphia in the United States. In 1914 the Shakespeare Association was founded in London, with Prof. Israel Gollancz (q.v.) as its first president.

SHAKING GRATES; MECHANICAL GRATES; TRAVELING GRATES; WATER GRATES. Bars for the support of the fire in a furnace, especially for steam making in boilers, which are so designed and mounted that a motion can be given to them from outside the furnace setting, for the removal of ashes, breaking up of clinker, and the opening of passages for air. This motion may be by hand with a true shaking grate or may be given by power in mechanical and traveling grates. Fires of anthracite coal should not be disturbed by shaking except to cleanse them of ash; fires of bituminous coal, and particularly that of the fat or pitchy character, need frequent attention to prevent or break up clinker and fused masses. This can be done by poking or slicing with a hand bar or tool; but to use a hand tool the fire door must be kept open, and this allows cool air to rush in on the fire with bad effect

on the hot boiler. Mechanical and traveling grates are features of nearly all mechanical stokers, as these must be self-cleansing as well as self-feeding. The bearings or supports of shaking grates cannot be lubricated on account of the heat, so that these are nearly always rocking or rolling contacts. The bars are usually of a toothed profile to make them effective in breaking up agglomerations.

Water Grates. These are hollow tubes or pipes within which water is circulated by a pump and on which the fire in the furnace is supported. The water is to keep the tubes from softening, sagging, or warping under the heat of the fire. They are much used in down-draft furnaces, where the draft is from the top of the fuel down through it and the flame is generated below the grate. The water circulates through the hollow grate bars and ultimately reaches the boiler proper. Water-grate bars are often used in combination with shaking bars, one water bar to about four solid shaking bars. See STOKER, AUTOMATIC MECHANICAL.

SHAKING PALSY. See PARALYSIS AGITANS.

SHALE (Ger. *Schale*, shell). An indurated clay consolidated chiefly by the pressure of overlying sediments and with a thinly bedded structure. By an increase in sandiness shale may pass into sandstone or (by an increase of lime carbonate) into limestone. Shale may occur in all formations from the Cambrian to Tertiary inclusive. In the Carboniferous formation shale beds of slaty appearance are frequently associated with the coal and are erroneously termed slate by the miners. Shale varies considerably in composition and color, and this variation exerts an important influence on its uses. When ground and mixed with water many shales become as plastic as ordinary surface clays. Some are very refractory, being used in the manufacture of fire brick. Others contain an abundance of impurities, such as iron oxide and lime carbonate. The former are mostly employed in the manufacture of common brick, unless the percentage of iron oxide is high, when they lend themselves more readily to the manufacture of mineral paint. Calcareous shales are often valuable as an ingredient of Portland cement. The gray or black color of shale is usually caused by the presence of carbonaceous matter, and there may be a notable quantity of bitumen. When there is sufficient bitumen present so that the mineral crackles and blazes in the fire, emitting a black smoke and bituminous odor, it is known as bituminous shale. This variety sometimes passes into coal. When shale is metamorphosed it changes to slate or by more intense metamorphism into schist. The slate splits along its cleavage planes, and not along the planes of stratification as in the case of the shale.

The value of certain decomposed shales, through which iron sulphide is disseminated for the manufacture of alum, has been long recognized. Such shales are known as *alum shales*. Shales of this kind are worked in Great Britain, France, and Germany.

Bituminous shales have attracted much notice as sources of oil for illuminating purposes. Such shales, which commonly occur in beds of Carboniferous age, have been found upon trial to yield from 30 to 50 gallons of crude oil per ton. A large industry based upon the distillation of shales has been established in Scotland. The name "argillite" is sometimes applied to shale, but this term refers more properly to slate. See CLAY; PETROLEUM; SHALE OIL; SLATE.

SHALE OIL. A mineral oil obtained from petroliferous shale. The oil is similar in general character to petroleum and is produced by the simple process of distilling in retorts shale that is rich in bituminous matter, whereby the volatile hydrocarbons that pass off are recovered by condensation. The crude oil by refining is made to yield naphtha, paraffin, and an illuminating product or kerosene, all of which are identical with the products obtained from the refining of American or Russian petroleum. In the distillation process a considerable quantity of ammonia water is condensed, forming a valuable by-product. The shale-oil industry is limited to certain districts of Scotland, more especially Linlithgowshire and Edinburghshire, where large supplies of oil shale are found in the Carboniferous rocks. One ton of shale yields about 40 gallons of oil distillate. It is only by practicing the utmost economy that the industry has been able to survive the competition of American petroleum. Oil-bearing shales have been worked also in New South Wales. They are known to occur in New Brunswick and Utah, but have not been developed.

Bibliography. J. C. Branner, "Oil-Bearing Shales of the Coast of Brazil," in American Institute of Mining Engineers, *Transactions*, vol. xxx (New York, 1900); J. E. Carne, "Kerosene and Shale Deposits of New South Wales," in Department of Mines and Agriculture of New South Wales, *Geological Survey Memoirs, No. 3* (Sydney, 1903); Steuart, *Economic Geology*, vol. iii (Lancaster, Pa., 1908); Woodruff and Day, in *United States Geological Survey, Bulletin No. 581* (1914) (Colorado and Utah).

SHA'LER, NATHANIEL SOUTHGATE (1841–1906). An American geologist and author, born at Newport, Ky. He graduated in 1862 at the Lawrence Scientific School, Harvard, and afterward served for two years in the Federal army as captain of a Kentucky volunteer battery. At Harvard he was professor of paleontology from 1868 until 1887, when he became professor of geology, and after 1891 dean of the Scientific School. From 1873 to 1880 he was director of the Kentucky Geological Survey and in 1884 became geologist for the Atlantic Coast division of the United States Geological Survey. In 1895 Shaler served as president of the Geological Society of America. He published: *Thoughts on the Nature of Intellectual Property and its Importance to the State* (1878); *Illustrations of the Earth's Surface: Glaciers* (1881), with W. M. Davis; *First Book in Geology* (1884); *Kentucky* (1885); *The United States of America* (1894); *The Interpretation of Nature* (1895); *Domesticated Animals* (1895); *Nature and Man in America* (1895); *American Highways* (1896); *Outlines of the Earth's History* (1898); *The Individual: A Study of Life and Death* (1900); *The Citizen* (1904); *The Neighbor* (1904); *Man and the Earth* (1905). Consult *The Autobiography of Nathaniel Southgate Shaler*, with a memoir by his wife (New York, 1909).

SHAL'LOT (from *Ascalon*, a city of Palestine), *Allium ascalonicum*. A perennial herb of the family Liliaceæ, a native of eastern Asia, introduced into Europe, it is said, from Ascalon by the Crusaders and much cultivated for its

bulbs and leaves, which are used respectively like those of onion and chive. The shallot is generally propagated by the cloves, which, if planted in spring, produce a crop by July or August. The flavor resembles but is milder than that of garlic. See ONION.

SHALLOW. An empty-headed country justice in Shakespeare's *Merry Wives of Windsor* and *Second Part of Henry IV*, probably a satire on Sir Thomas Lucy, Shakespeare's enemy.

SHALMANESER, shăl'mȧ-nē'zēr (Heb. from Assyr. *Shulmanu-asharidu*, Shulman is first). The name of several famous kings of Assyria. 1. SHALMANESER I (c.1320–1290 B.C.), son of Adadnirari II, conquered northern Mesopotamia and seems to have invaded northern Syria. He removed the capital from Assur (q.v.) to Calah (q.v.). 2. SHALMANESER II (c.1050–40), the son of Asurnazirpal II, is as yet known only by name. 3. SHALMANESER III (860–825) defeated the King of Bit Adini in Mesopotamia and annexed his domain (859–856); met a coalition of Syrian princes led by Barhadad I of Damascus at Karkar in 854, among them Ahab of Israel, and in spite of his own assurances is likely to have been defeated, as he certainly was unable to gain Damascus or to proceed against his other enemies; made unsuccessful expeditions against Damascus in 849, 846, 842, and 839, but received presents from Jehu of Judah, was driven back by the Chaldians in Armenia, but subdued some Median tribes. 4. SHALMANESER IV (783–773) made 10 expeditions against the Chaldians in Armenia, who at that time held the leading place in western Asia. 5. SHALMANESER V (728–722) succeeded Tiglath-pileser IV, but his relation to the latter is not certain. The chief event of his reign seems to have been the siege and capture of Samaria (Samarain), apparently in the year 723. That he actually took Samaria is suggested by the Babylonian Chronicle and clearly stated in 2 Kings xvii. 3–6. Against this disinterested testimony the assertion of Sargon II that he captured the city can scarcely be maintained. Josephus refers to a five years' siege of Tyre, but this has not been corroborated by any cuneiform account. Consult: Winckler and Peiser, in *Keilinschriftliche Bibliothek*, vol. i (Leipzig, 1889); Hugo Gressmann, *Altorientalische Texte und Bilder* (Tübingen, 1909); Rogers, *Cuneiform Parallels to the Old Testament* (New York, 1912). See ASSYRIA.

SHAMA, shä'mȧ (Hind. *shāmā*). A thrush-like bird (*Copsychus macrura*) of India, where it is regarded as the finest of local song birds and is constantly caught and caged. Its colors are in the male black and chestnut, but those of the female are paler. One species inhabits the Philippines. Consult *English Illustrated Magazine* (London, May, 1893), and H. D. Astley, *The Avicultural Magazine*, vol. v, no. 6 (ib., 1907).

SHAMAKHA. See SHEMAKHA.

SHAMANISM, shä'mȧn-ĭz'm (Tungusian *samân*, priest). The name applied to the religion of certain Ural-Altaic peoples, as Finns, Hungarians, Turks, Mongolians, and Tunguses, but chiefly those of northwestern Asia. At present Shamanism is best represented by the practices of the Tunguses. According to this religion there are three spiritual realms, heavenly, earthly, and subterranean. The earthly realm is on the surface of the earth, while the other two are either above or below it. The good spirits live above the earth; the evil, below (within) it. The upper world of light is composed of 17 such realms or heavens; the lower world of darkness, of seven (or nine) hells. Above live the greatest lords, *kans*, gods, and good spirits; below, devils, demons, goblins, and the damned. The world was created by Kaira Kan, the highest god. Because of his evil intentions the first man lost his ethereal nature, but Kaira, out of compassion, created earth for him, till his continued impiety caused him to be banished into darkness. This man was Erlik, who became lord of hell. Then Kaira made other men to live on the earth, who became the nine ancestors of the nine races of men. Erlik, however, misled them, so that Kaira resolved to leave men to themselves thereafter; but Erlik was again banished to the under world, while the god made for himself the upper world of 17 heavens. Seeing this, Erlik made a last effort to be as great as Kaira and also created a heaven; but Kaira shattered it and this time thrust Erlik down to live forever in the next to the lowest world of darkness, ascending himself to his permanent abode in the seventeenth heaven. From Kaira came as emanations the three highest gods, Bai Uelgän, who lives in the sixteenth heaven, Kysagan, in the ninth heaven, and Mergen, in the seventh heaven, where also lives the mother sun, while the father moon lives in the sixth heaven. The demiurge creator dwells in the fifth heaven, and Bai Uelgän's two sons in the third heaven. In the latter is the spring of all life, "the sea of milk," the mountain of the gods, and the paradise to which go the blessed souls.

Beneath this realm is that of Jersu, earth itself, conceived as an animate spiritual creation. There are 17 lords of Jersu, each like a god. One is the lord of the Seventeen Seas; another, the highest, is Jo Kan, who inhabits the navel of earth; and a third is the national god Altai Kan.

All the gods and demigods of heaven and earth are favorable to man, but only the Jersu Kans may be approached directly by common men. Both the spirits of the upper and under world must be approached through the mediatory spirits of the dead—in the case of good gods through the *Somo*, i.e., the nine guardian ancestors of man. The power to move the spirits is inherent only in certain families. This power manifests itself by inspiration shown in trembling, sweating contortions, ravings, etc. When thus inspired, one can act as mediator between men and the spirits, and he who does this is a Shaman or Kam, his function being called *kamlanie*. The Shaman seems to mediate with the Manes and the latter with the spirits, but in reality the Shaman is so infused with the Manes that all of his power is none else than that of the ancestor who is in possession of the Shaman's soul.

The evil ones in Erlik's realm occupy various hells, and the lowest of all is that of the damned, Kasyrgan by name, in which the victims are boiled in a pot out of which they can come according to their virtue or by the help of good spirits. Though Erlik is the foe of man, he is called Father, "because all men belong to him and at the end he takes the lives of all." For Erlik is the cause of death, as he is of sickness, poverty, and all other misfortunes. Hence men honor Erlik first of all and make him rich offerings, in order to conciliate his good will.

When a human being is born a good spirit is sent down by Bai Uelgän to supply it with life from the sea of milk and ever after to remain at its right hand, guiding it aright. But simultaneously Erlik sends a devil from below to stand at the man's left hand and mislead him. After death the soul goes to Erlik, who judges it. If its virtues predominate Erlik has no power over it and it goes to the third heaven, but if its evil is greater than its good it is cast in the boiling hell below. Yet human virtue is not enough to save a soul, for all spirits are envious and desire men's goods, and it is safest to satisfy both kinds of spirits. For this purpose a Shaman is requisite, whose office is to sacrifice, give oracles, and purify a house from the spirits of the dead. Consult: Roskoff, *Das Religionswesen der rohesten Naturvölker* (Leipzig, 1880); Radloff, *Das Schamanentum und sein Kultus* (ib., 1885); De Harlez, *La religion nationale des Tartares orientaux* (Louvain, 1888); Radloff, *Aus Sibirien* (2d ed., Leipzig, 1893); Peschel, *Völkerkunde* (ib., 1897); Achelis, *Moderne Völkerkunde* (Stuttgart, 1896).

SHA'MASH (Bab. *shamshu*, sun). The sun god in the Babylonian-Assyrian pantheon, corresponding to the Sumerian Utu. While other deities, e.g., Nergal (q.v.), represent particular phases of the sun, Shamash is the solar deity without limitation. The theology represents him as son of Sin, the Moon god, in accordance with the original preëminence of the moon over the sun in ancient thought, but Shamash attained a rank of first-rate importance. The chief seats of his worship were Larsa and Sippar in south and north Babylonia respectively. In both places his temple was called Ebabbara; at Sippar Ai is named as his "bride." He was the beneficent deity of light and warmth, being invoked in healing, and as the chief god of oracles he became the judge par excellence. On the stele of Hammurapi (q.v.) he is called "the great judge of heaven and earth." His two children present this idea allegorically in their names, Kettu (right) and Meshar (equity). He is also described as riding in his chariot, which is guided by Bunene—an idea suggestive of Greek mythology. The Sun deity also appears in a feminine form in south Arabia, while local names, like Beth-shemesh, indicate the same cult in Syria. In Solomon's temple horses and chariots representing the Sun god were kept until they were removed by Josiah (2 Kings xxiii. 11). Consult: Morris Jastrow, *Religion of Babylonia and Assyria* (Boston, 1898); id., *Die Religion Babyloniens und Assyriens* (Giessen, 1902–12); Zimmern and Winckler, in Schrader, *Keilinschriften und das Alte Testament* (3d ed., Berlin, 1902); A. K. Jeremias, *Das Alte Testament im Lichte des Alten Ostens* (Leipzig, 1906); Nathaniel Schmidt, *The Messages of the Poets* (New York, 1911).

SHAMMAI, shăm'ā-ī. A Jewish teacher, contemporary of Hillel (q.v.), and vice president of the Sanhedrin (q.v.) during the reign of Herod, after Menahem the Essene had resigned this position. His teachings are marked by great severity and insistence upon details. The results of the rigor of the school appear in the doctrines of the Zealots (q.v.), who were nearly all followers of Shammai. Shammai is supposed to be identical with Sameas, mentioned by Josephus (*Ant.*, xiv, 9, 4), who opposed Herod on his appearance before the Sanhedrin in 47 B.C. He had a violent temper, lacking the gentleness and patience of his colleague Hillel. Consult W. Bacher, *Die Agada der Tannaiten* (2d ed., Strassburg, 1903).

SHAM'MY, or SHAM'MOY. See CHAMOIS.

SHAMO, shä'mō'. A desert region of Central Asia. See GOBI.

SHAMOKIN, shā-mō'kĭn. A borough of Northumberland Co., Pa., 40 miles north by east of Harrisburg, on the Pennsylvania and the Philadelphia and Reading railroads (Map: Pennsylvania, J 5). It is the centre of an extensive anthracite coal-mining industry and has also silk and knitting mills, stocking and shirt factories, wagon shops, ironworks, and brickyards. Pop., 1900, 18,202; 1910, 19,588; 1915 (U. S. est.), 20,985; 1920, 21,204.

SHAM'ROCK (Ir. *seamrog*, dim. of *seamar*, trefoil). A national emblem of Ireland, said to have been first assumed as the badge of Ireland from the circumstances that St. Patrick made use of it to illustrate the doctrine of the Trinity. The *Trifolium minus*, a hop clover, is the generally accepted modern shamrock, but the wood sorrel, the bird's-foot trefoil or medick, and the small-leaved clover (*Trifolium repens*), which has held a superstitious respect from early times, have claims to be associated with the national emblem. See LOTUS.

SHAMROCK. The name of three racing yachts owned by Sir Thomas Lipton, designed and built to compete for the America's Cup in the international yacht races off Sandy Hook, N. Y. See YACHTING.

SHAMYL, shä'mĭl, or **SCHAMYL** (1797–1871). A celebrated leader of the independent tribes in the Caucasus, born at Aul-Himry in Daghestan, also known by the name Ghazi-Mohammed. He endeavored to do away with the feuds of the Caucasian tribes and unite them against the Russians. He was in the rebellion which broke out in 1824 and distinguished himself in the defense of Himry against the Russians in October, 1831. Shamyl was elected imam in 1835. Shamyl's change of military tactics, from open to guerrilla warfare, brought successes to the mountaineers. In 1839 Shamyl, after two defeats, was trapped in Akulgo, which was stormed, and his followers slain, but the leader escaped. He waged successful campaigns in 1843 and 1844 and gained to his side the Caucasian tribes which had hitherto favored Russia. A civil and criminal code and a regular system of taxation were established, and Dargo was made the capital of the principality thus created, the population of which exceeded 1,000,000. After the conclusion of the Eastern War (1853–56) the Russians resumed their attacks, advancing in several columns, establishing forts, and forcing the mountain tribes to detach themselves from Shamyl. On April 13, 1859, Shamyl's stronghold, Veden, was taken after seven weeks' siege and he became a guerrilla chief. He was captured, with the remnant of his followers, at Cunib, Sept. 6, 1859, sent to St. Petersburg, and a few days afterward was assigned a residence at Kaluga, with a pension of 10,000 rubles. He went in 1870 to Mecca, remaining a parole prisoner of the Russian government. He died at Medina in March, 1871.

SHANDY. See TRISTRAM SHANDY.

SHANGHAI, shăng'hī' (Chin., above the sea). The most important commercial city

and treaty port of central China, in the Province of Kiangsu (q.v.), 160 miles east-southeast of Nanking at the junction of Wusung River (known to foreigners as Soochow Creek) with the Huang-pu at a point 12 miles from their mouth, the estuary of the Yang-tse on the coast of the Yellow Sea (Map: China, M 5). The port has good anchorage and an easy access to the ocean. Shanghai is on the eastern edge of that great alluvial deposit called the Great Plain of China and stretches for 10 miles along the left bank of the Huang-pu opposite P'utung. The country around is low, level, highly cultivated, and crossed by many creeks that serve for boat communication as well as for irrigation. The erosion from the hills in the Province of Szechuan has for centuries been deposited in old lake basins now nearly filled up. This erosion will soon be borne down to the Yang-tse delta and threatens to make Shanghai an inland city. The climate is trying, especially in the native city. The summer is hot, but the winter is pleasant. The isothermal lines show that China has an average temperature lower than any other country of the same latitude. Sudden drops of 20 to 30 degrees occur in the temperature and are unfavorable for those with malaria or dysentery. The air is moist. Commercial Shanghai has been safeguarded by modern sanitary methods. The city is the eastern terminus of two railroads—one from Hangchow, the other from Nanking. Forty-seven miles to the west is the Grand Canal at Soochow. Steamship lines go to the great marts of the world. The first six miles of railway in China was laid from Shanghai in 1876, but bought by the native authorities and torn up.

The native part is first found mentioned in 1015 and became a district city or *hien* in 1360. Around it are walls 3½ miles in circuit and having six gates. The streets are narrow and ill drained. The shops, dwellings, and public places are such as are usual in similar Chinese cities. It is about 1 mile in diameter, but with populous suburbs. It was held for 17 months by the Triad rebels during the Taiping rebellion. In 1855 English and French troops drove out the rebels and remained till 1860. The Shanghai of commerce lies outside the wall of the native city upon the north. Its site (5362 acres) was ceded to the British in 1843 under the Treaty of Nanking opening five ports to foreign trade. It stretches ⅝ of a mile along the Huang-pu River, south of Soochow Creek and north of Yang-king-pang Creek. The French concession is 356 acres, ceded in 1847. It is south of the British tract and extends up to the walls of the native city. It has its own municipal government, but no restrictions as to nationality of residents or regarding land renters who now are voters. The American concession originated in no treaty right. It was popularly so termed from the American Consul's having his residence there. In 1863 it was surveyed and incorporated with the British settlement for municipal purposes. The chief native suburb lies above the French settlement, between the river and the east gate of the city. Here the junks concentrate. The harbor extends 6 miles up the river. "Exterritoriality" in treaty clauses subjects all foreigners to the civil, criminal, and political jurisdiction of the consuls of their own countries. Great Britain early threw her courts open to the citizens of all other nationalities. Germany has special courts open by agreement to citizens of other countries.

The tow path of the river bank is reserved as an esplanade or *bund*. Streets at right angles to this *bund* are named from cities of China; streets parallel to the *bund* are named from the provinces of China. All the streets of commercial Shanghai are modern in structure and care, are well lighted, and are bordered by imposing buildings—hospitals, schools, clubhouses, colleges, theatres, libraries, a Chamber of Commerce, a Masonic Hall, Trinity Cathedral, a Roman Catholic church, a Mixed Court House, etc.; opposite the *bund* there are a park and monuments. P'u-tung is a district on the eastern bank of the river. It has shipyards, dry docks, foundries, engineering works, and warehouses. Among manufacturing plants in P'u-tung are cotton mills, silk mills, ginning factories, packing houses, paper mills, match factories, flour mills. Many of the plants are native owned. Shanghai is now the leading publishing centre for foreign or native literature regarding all Chinese matters. The combined settlements cover an area of about 8 square miles. Pop., 1910, 13,436 foreigners and 413,313 natives. Of the foreign population in 1910, 4465 were British, 3361 Japanese, 941 American, 811 German, and 330 French. The estimated population in 1912 was 651,000.

The chief imports are cotton piece goods, metals, kerosene, aniline dyes, opium, sugar, wool, cigarettes, raw cotton, machinery. The principal exports are cotton yarn, wool, hides, egg products, flour, beans, antimony, cantharides, bristles, rice, cottonseed oil, wood oil, books, silk, tea, raw cotton. In 1914, 20,704 vessels, of a combined tonnage of 18,950,918, entered and cleared the port in trade, 40 per cent of the tonnage being British. The Shanghai share of the entire foreign trade of China amounted to 42.5 per cent in 1914. In that year the total merchandise imported was valued at $166,774,094 and that exported, at $103,236,774.

SHANHAIKWAN, shän'hī'kwän' (Chin., mountain sea barrier). A fortified town of the Province of Chihli, China, situated at the east end of the Great Wall, where it enters the Gulf of Pechili (Map: China, M 3). It consists of three towns separated by strong walls, the whole surrounded by one wall. The inner town, which is the largest of the three, is devoted to business, the one on the east is occupied by soldiers and officials, and that on the west by soldiers and tradespeople. Pop., 30,000. It is a station on the railway leading from Tientsin to Mukden (q.v.). There are large railway shops here.

SHANK'LIN, William Arnold (1862–). An American university president. He was born at Carrollton, Mo., and was educated at Hamilton College (A.B., 1883) and at Garrett Biblical Institute (S.T.B., 1891). Ordained to the Methodist Episcopal ministry, he held pastorates in Kansas, at Spokane and Seattle, Wash., at Dubuque, Iowa, and at Reading, Pa. He was president of Upper Iowa University in 1905–09 and thereafter president of Wesleyan University. He received many honorary degrees.

SHAN'LY, Walter (1819–?1901). A Canadian railway engineer and legislator. He was born at Stradbally, Ireland, went to Canada with his parents in 1836, and became a civil

engineer. He was first in government service on the Beauharnois and Welland canals, afterward engineer of the Ottawa and Prescott Railway (1848–50), engineer of the western division of the Grand Trunk Railway (1851–59), and general manager of that railway (1858–62). With his brother, Francis Shanly, he constructed the Hoosac Tunnel in Massachusetts. He was a Conservative member of the Canada Legislative Assembly (1863–67) and after Confederation was a member of the House of Commons in 1867–72, in 1883–85, and in 1887–90.

SHAN'NON. The longest river in Ireland and in the United Kingdom. It rises in the Cuilcagh Mountains, County of Cavan, and after a southwest course of 254 miles falls into the Atlantic Ocean between the headlands of Loop and Kerry (Map: Ireland, B, C 6). It passes through Loughs Allen, Boderg, Ree, and Derg, and below Limerick it widens into an estuary 56 miles long and 2 to 10 miles wide. It has been partly canalized and has been made navigable to the head of Lough Allen, not far from its source. It is connected with Dublin by the Grand and Royal canals and with Belfast. Vessels of 1000 tons reach Limerick, and small steamers ply to Athlone, but the number of canal locks (21) impair the utility of the river for navigation. Consult Harvey, *The Shannon and its Lakes* (London, 1896).

SHANNON, Charles Hazelwood (1865–). An English painter, etcher, and lithographer. He was born at Sleaford (Lincolnshire) and studied at the Lambeth School of Art. Early devoting himself to wood engraving and lithography, he first exhibited as a painter in 1897 and was elected an associate of the Royal Academy in 1911. His work, usually classical in subject, shows the influence of the Venetian masters and is characterized by dreamy, rhythmic beauty of line and a rich, low-toned color scheme. Well-known examples are "Tibullus in the House of Delia," "Hermes and the Infant Bacchus," "The Sleeping Nymph," and the "Toilet of Venus" (Lord Northcliffe). Among his portraits are: "Lady with the Green Fan" (Dublin Municipal Gallery), "The Lady with the Cyclamen," "Study in Grey" (Munich Gallery), and portrait of Mr. Staats-Forbes (Bremen). Complete sets of his lithographs and etchings are in the British Museum and the Berlin and Dresden print rooms.

SHANNON, James Jebusa (1862–). An English portrait and figure painter. He was born at Auburn, N. Y., but passed his boyhood in Canada and lived in London from the age of 16, when he entered the South Kensington Art School. He was elected a member of the Royal Academy in 1909. His art is thoroughly pictorial, combining fluent brushwork, softly modulated color, and pleasing characterization. He received many prizes, and gold medals at Paris (1889), Buffalo (1901), St. Louis (1904), and Venice (1906). His best-known portraits include: "A Lady in Black" (1886); Henry Vigne (1887); Lady Henry Cavendish-Bentinck; Lord Ross; Lady Marjorie Manners; "Lady Carbery and her Children; "Girl in Brown" (Corcoran Art Gallery, Washington); "Miss Kitty" (Carnegie Institute, Pittsburgh). Delightful figure pieces are: "Iris"; "The Fireside"; "Springtime"; "Fairy Tales" (1895), and "Magnolia" (1899), both in the Metropolitan Museum, New York; "The Flower Girl" (Tate Gallery, London); "The Sirens."

SHANNON, Wilson (1802–77). An American political leader. He was born in Belmont Co., Ohio, was educated at Athens College in that State and at Transylvania University, Kentucky, and later began the practice of law at St. Clairsville, Ohio. In 1838 he was elected Governor of Ohio, as a Democrat. At the end of a second term (1844) he was sent as Minister to Mexico, where he remained until war began with that country. In 1855 he was appointed Governor of Kansas Territory to succeed Andrew H. Reeder (q.v.). During his administration occurred the Wakarusa War, the arrest of Gov. Charles Robinson (q.v.) and others of the free-State government, the capture of Lawrence, the dispersal of the free-State Legislature at Topeka, the Potawatami Massacre, and the events leading up to the "Treaty of Lawrence." In the early days of his administration Governor Shannon affiliated almost entirely with the Proslavery party, but later gave great offense by refusing to act as its leaders desired. At length, after having been threatened with assassination, he resigned in August, 1856, a little less than a year after taking office. He settled in Lecompton and later in Lawrence, where he died. Consult L. W. Spring, *Kansas*, in the "American Commonwealth Series" (Boston, 1885), and Charles Robinson, *The Kansas Conflict* (New York, 1892).

SHANS, shänz. A numerous group of tribes on the frontiers of China, Burma, and Siam, extending considerably to the south. Physically and linguistically they belong, together with the Laotians, the Thos-Muong tribes of the Chinese-Tongking frontier, and the civilized Siamese of the southwest, to the Thai, one of the great stocks of Farther India. The Shans are distributed among several semi-independent states subject to Burma, Siam, and China. Their own method of government is more or less democratic, the chiefs being not at all absolute, while the women have practically the same privileges as the men, something noteworthy in Indo-China. Situated as they are in the upland river valleys, halfway between the cities of southern China and the commercial ports of Burma and Siam, the Shans take part in the extensive trade. The culture of the Shans varies from the condition of the wild Palungs to that of the people of Zimme and some of the other states who are little inferior to the other civilized and semi-civilized tribes of Indo-China. Many of the Shans are mountainous hunter tribes of great courage and honesty; others are agriculturalists of a rather high order and cattle breeders. Tea is a chief object of cultivation. Others are timber cutters and woodworkers; others again skillful workers in iron, goldbeaters, etc. The religion of many of the Shan tribes is Buddhism, but the more independent tribes retain their ancient customs to a very large extent. In the period from the twelfth to the sixteenth century the greater part of the peninsula was under the rule of the Empire of Mau, developed from one of the northern Shan states. Another remarkable Shan state was Zimme, famous in the sixteenth century, subdued by Siam in the latter part of the eighteenth century, and still subject to the Empire. The numerous ruins of cities and towns existing in the Shan country are thought to indicate great political activity in the period noted above and perhaps long before then. Consult: Anderson, *Mandalay to Moulmein* (London, 1876); Colquhoun, *Amongst*

the Shans (ib., 1885); Fournereau, *Le Siam ancien* (Paris, 1895).

SHANSI, shän'sē' (Chin., mountains west, i.e., west of Chihli). An inland province of China, originally bounded on the north by the Great Wall, but now including south Mongolia south of the In or Yin Mountains (Map: China, K 4). Its greatest length is from north to south. Area, 81,830 square miles. The province is mountainous, especially in its northern half, with ranges (some of them of great height) having a general southwest to northeast trend, forming seven great basins, the more northerly of which drain towards the plain of Peking, some to the east and southeast to the great plain, and the others southwest to the Hoang-ho. The most important river of Shansi is the Fen-ho, navigable in part and watering the two richest plains of the country. It flows into the Hoang.

The highest mountain peaks are found in the Tai-ho Range (8000 feet) in the south-central part of the province, and the sacred Wu-tai Mountains (10,000 to 12,000 feet) farther north, about lat. 39° and near the border of Chihli, noted for their wild grandeur and for the 360 great Buddhist temples which crown their peaks or nestle in their recesses and which are annually visited by tens of thousands of pilgrims.

Shansi is rich in minerals. Coal, both bituminous and anthracite and of the finest quality, is found everywhere; iron of the best quality, usually associated with coal, abounds and is worked; copper has been found in over 100 localities; tin near Mount Ki and elsewhere; and silver north of Taiyuenfu, the capital. Salt lakes and springs are numerous, and near the great walled village of Lutsun, in the southwest, are extensive salt works, the oldest in the Chinese Empire, dating back nearly 5000 years.

A notable feature of the province is the exceedingly fertile loess, or terrace deposit, varying in thickness from 1 foot to 1000 feet and cut up in many places by the rains and rivers into an intricate network of deep gullies which render travel impossible except along well-traced tracks. The agricultural belt is comparatively small, and the soil does not produce sufficient for home consumption. Hence, while large quantities of coal, iron, and salt are exported, opium, wheat, rice, and other foodstuffs have to be imported as well as cotton and cotton cloth. Tobacco is grown in the south; in the southwest between Kiaichow and Tungkwan the country is a continuous orchard, producing apples, pears, plums, persimmons, jujubes, etc., and in the plain of Taiyuenfu (the capital), besides other fruits, the best grapes in China are raised. Shansi is a wealthy province. The houses are substantially built of brick, frequently two to three stories high, and in a style of architecture different from that found elsewhere in the country. In the loess region the majority of the people live in caves, sometimes two or more stories high, cut into the deposit and faced with brick, with well-built stairs leading to the upper stories. The inhabitants as a rule are civil and friendly to foreigners, are characterized by an enterprising commercial spirit, and the Shansi men are well known as the bankers and pawnbrokers of the Empire. Pop., about 12,200,456.

The great highway of the province runs from southwest to northeast, connecting the fortress of Tungkwan at the point where the provinces of Shensi, Shansi, and Honan come together, with Kalgan (q.v.), a branch running northeast from Taiyuenfu to Chingtingfu, Paoting, Peking, etc., and another from Tatung, about lat. 40° N., northwest to Kwei-hwa Ch'ing and west Mongolia. Railway extension will be along these lines.

SHAN (shän) **STATES.** A name applied to a number of semi-independent states in southeast Asia, occupying the region between Burma, China, Siam, and Tongking (Map: Burma, C 2). They derive their name from their inhabitants, the Shans (q.v.).

SHANTUNG, shän'tōōng' (Chin., mountains east, i.e., east of Chihli). A maritime province of China, a portion of which consists of a mountainous promontory 100 miles wide, which projects eastward from the mainland into the Yellow Sea for 200 miles and is distant from the peninsula of Korea less than a day's sail (Map: China, L 4). Area, about 55,970 square miles. The central portion is occupied by massive limestone mountains, culminating in Mount Tai (4111 feet), famous in history and considered sacred by the people. West, southwest, and north of these mountains lie the Shantung portions of the great alluvial plain of north China; while east and southeast of the mountains and throughout the promontory are many fertile valleys and small plains. As a rule these mountains are destitute of forests. The province is well watered, though its lakes are few and small, and there are no rivers of importance except the Hoang-ho, which traverses the great plain in the west and north. The Grand Canal runs through the whole province from north to south. The fertile loess deposit is found in several places, and agriculture flourishes. The crops include some cotton, very little rice, but much tobacco, indigo, wheat, barley, maize, millet, pulse, peanuts, and vegetables. The fruits are of almost all kinds. Silk is an important product, the chief seat of which is Yenchow, on the great plain; and pongee, the spun-silk fabric derived from the cocoons of the wild silkworm, is much exported to foreign countries. The finest brocaded silk is woven near Tsinanfu, the capital. Straw plaiting is an important industry, and much insect wax is produced.

The fauna includes wolves, badgers, foxes, several species of poisonous snakes, scorpions, etc., and among the birds pheasants, partridges, wild ducks and turkeys, Manchurian cranes, etc. The surrounding waters as well as the rivers teem with fish. Shantung is especially rich in minerals. Coal and iron abound, and gold, galena, copper, antimony, marble, granite, asbestos, and sulphur are abundant. There are four great coal fields. The coast line is about 750 miles. There are many good harbors. The chief are: on the north coast, Yangkiakow, at the mouth of the Little Tsin River (canalized in 1891 and extended westward to Tsinanfu), a few miles south of the mouth of the Hoang-ho (which now occupies the channel of the Great Tsin River); Chifu (Chefoo) (q.v.), a treaty port; Weihaiwei, now leased by Great Britain, and on the south coast Shitao and Tsingtau on the southwest corner of the Laoshan peninsula. (See KIAOCHOW.) The climate is healthful throughout. The rainy season lasts six weeks and occurs in June and July. The snowfall is heavy, and the harbors on the north coast are

frequently blocked with ice. The temperature ranges from 20° F. below zero to 60° F. above.

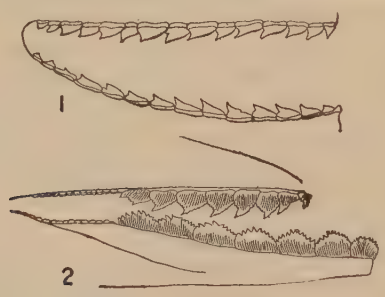
Shantung is noted as containing the birthplaces of both Confucius and Mencius (qq.v.) and has played an important part in the history of the country. Pop., 38,247,000.

Railways were introduced by the Germans, extending from the new port of Tsingtau northward to Weihien and thence west to Tsinanfu (q.v.), and beyond, meeting at two different points the projected Anglo-German line from Tientsin to Chinkiangfu (q.v.). The German leases and railroads were temporarily controlled by the Japanese during the Great War, pending final settlement with China over Kiaochow. See VOLUME XXIV.

SHAREHOLDER. See STOCKHOLDER.

SHARI, shä'rē. A river of French Equatorial Africa, the chief feeder of Lake Chad (Map: Africa, F 3). Its numerous head streams drain the central Sudan. The chief of these is the Bamingi. Its largest tributary is the Logone. In its lower course the Shari forms the boundary between Kamerun and Bagirmi and is navigable from Maffaling to Gulfei, a distance of 186 miles.

SHARK (Lat. *carcharus*, dogfish). The name given to such elasmobranch fishes (see ELASMOBRANCHII) as have their gill openings lateral instead of ventral, as in the skates (Batoidei). The body is nearly always elongate, tapering gradually to the tail and not much thickened in the middle. The muzzle projects over the mouth; the nostrils are situated on the underside of the muzzle. The males have claspers. There are usually two dorsal fins, but in the small order of notidanoid sharks there is only a single one. The gill openings are five, excepting in the cow sharks, where there are six or seven. The skin has no scales, but minute denticles, much resembling teeth in their development and structure. The teeth are generally large, sharp, and formed for cutting, with the edge often serrated. In the cestracionts (q.v.) they are pavement-like, and in some genera are small and numerous. As the rows of teeth on the ridge of the jaw are worn away they are continually replaced by new series.



TYPES OF SHARK TEETH.
1, plain-edged cusps; 2, serrated cusps.

The teeth of sharks are dermal structures never ankylosed to the jaw or to any other skeletal part, but are embedded in a tough fibrous membrane and are arranged in concentric rows. The row of denticles that occupies the border of the jaw is erect. Adjacent rows are only partially erect, while those behind lie recumbent. The fibrous gum moves up and outward over the surface of the jaw and carries each successive row of teeth to a functional position on the jaw. When a row of teeth has passed this point the teeth fall out. This fact accounts for the great number of shark's teeth which are preserved in geological deposits, for each shark during its life casts off a great many teeth. Both in form and structure the dermal spines on the external skin of certain sharks cannot be distinguished from the spines that occur in the mouth and function as teeth.

Most sharks are carnivorous and voracious, some of them taking objects as large as man. Some live on small marine organisms, and a few are herbivorous. Some species are ovoviviparous, others lay eggs. The eggs are large in comparison with those of osseous fishes and are square or oblong in form, with a tough horny coat, each corner prolonged into a tendril, apparently of use for their entanglement among seaweeds to prevent being thrown about. In some of the viviparous species the embryo is attached to the walls of the uterus by a sort of placenta. Sharks are found in all seas, but are most abundant in the tropics. They are nearly all marine, a few entering fresh water, and one species living continually in Lake Nicaragua.

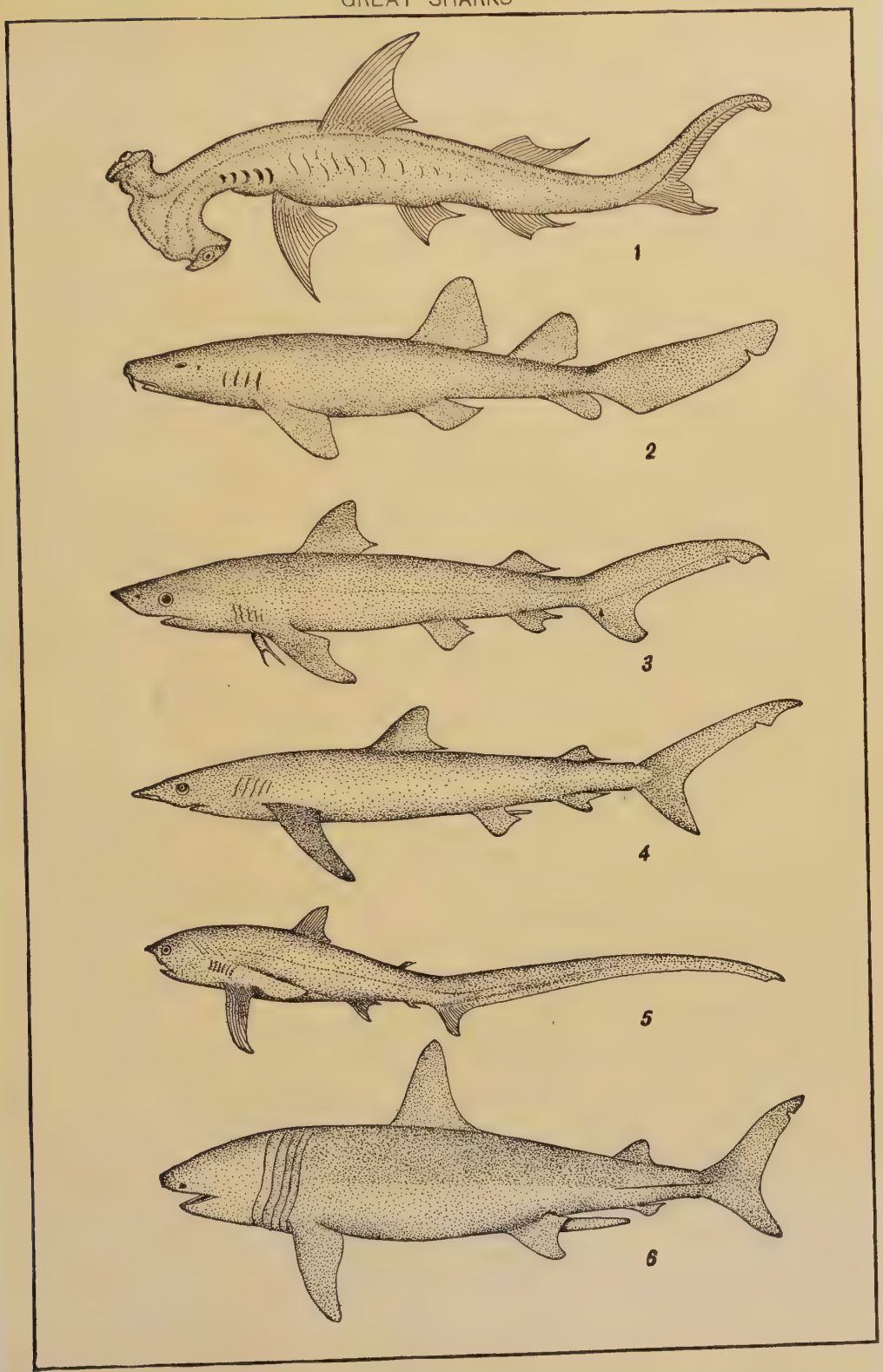
A TYPICAL SHARK'S EGG.

The rough skin of sharks is employed by joiners for polishing fine-grained wood and for covering the hilts of swords, tools, and the like, to make them firmer in the grasp. (See SHAGREEN.) The flesh is coarse, but is sometimes eaten. The fins abound in gelatin and are much used by the Chinese for making a rich gelatinous soup. The liver yields a large quantity of valuable oil. See OIL SHARK.

The sharks embrace several families, among which prominent ones are the Hexanchidæ (cow sharks), Cestraciontidæ (Port Jackson sharks), Heterodontidæ (bullhead sharks), Ginglymostomatidæ (nurse sharks), Galeidæ (dog sharks, topes, tiger sharks, man-eaters, requiems, etc.), Sphyrinidæ (hammerheads), Alopiidæ (threshers), Carchariidæ (sand sharks), Lamnidæ (or beagles), Cetorhinidæ (the basking sharks), and Squalidæ (dogfishes). Most of these will be found described under their common names, as, for example, the bonnet shark, or bonnet head, so called from the fleshy protuberance on the dorsal side of the head. Consult the authorities mentioned under FISH. See accompanying Plate of GREAT SHARKS; also Plates of LAMPREYS AND DOGFISH; PHILIPPINE FISHES.

Fossil Shark. Fossilized remains of sharks occur from the Lower Devonian upward, and even in the Upper Silurian detached fin spines, teeth, and dermal denticles resembling those of elasmobranchs are found, being thus among the earliest known remains of vertebrates. The relationships of these Silurian forms are doubtful, however, and some of them (the Cœlolepidæ, including *Lanarkia* and *Thelodus*) possibly have closer affinities with the remarkable group of ostracoderms than with elasmobranchs. From the Devonian upward undoubted sharks are met

GREAT SHARKS



1. HAMMERHEAD (Sphyrna tiburo).
2. NURSE SHARK (Ginglymostoma cirrata).
3. REQUIEM SHARK (Carcharinus lamia).
4. GREAT BLUE SHARK (Prionace glauca).
5. THRESHER (Alopias vulpes).
6. BASKING SHARK (Cetorhinus maximus).

with, many known only from fragments of the dermal structures—teeth, shagreen denticles, and fin spines. These spines, when not definitely assignable to any genera, are termed ichthyodorulites. In a few cases the cartilaginous endoskeleton is hardened by deposition of phosphate of lime—calcified—so that jaws, vertebræ, fin structure, etc., are readily fossilized. Elasmobranch paleontology, which may be said to have originated in the work of Louis Agassiz, has demonstrated that the sharks and rays of the present time represent but an insignificant remnant of a group which attained its maximum degree of differentiation and specialization as early as the Carboniferous. The characteristic forms of the Paleozoic, however, the primitive as well as the highly specialized, died out in the Permian, and their descendants of the Mesozoic have persisted to the present with little change.

The most primitive of fossil elasmobranchs are included in the order Pleuropterygii (side fin), of which the most typical genus is *Cladoselache* from the Upper Devonian or Lower Carboniferous of Ohio. In this form the paired fins are mere horizontal lappet-like folds along the sides of the body, supported by two rows of cartilaginous rods, the basals, embedded within the body, and the radials within the fin lappet and extending outward to its edge. According to the commonly accepted fin-fold theory of paired limbs, this is the most primitive known type of paired fin, and the lappets are to be regarded as persistent portions of a former continuous lateral fold, possessed by some unknown ancestor. Since these lappet fins, or pleuropterygia, were capable of but very slight motion, their function was chiefly that of balancing organs, while the powerful turned-up, or heterocercal, tail served as the organ of propulsion. Other primitive characters of this fish are the terminally placed mouth, the unconstricted notochord, and the simple dermal skeleton. *Cladoselache*, judging from its many primitive characters and lack of specialization, probably stands structurally very near the ancestral form which gave rise to the more specialized sharks, to the bony fishes, and through these to the higher vertebrates. Several cladoselachids are known, and the most generalized of these may be regarded as the most primitive true fish. None of them exceeds 6 feet in length. The spiny sharks (commonly ranked as an order Acanthodii) comprise a number of Paleozoic forms which resemble the cladoselachids in many respects, but differ from them in that the blade of the fins, except the caudal, is almost entirely dermal, the skeletal fin support being reduced to a stiff spine at the anterior border; genera *Acanthodes* and *Mesacanthus*. In one family, represented by *Climatius*, a series of spines along the side of the body suggests the continuous lateral fin fold. The acanthodians have the dermal skeleton highly developed, especially in the region of the skull and shoulder girdle. Some ichthyologists place the group among the pleuropterygians. A widely different order of Paleozoic sharks is that termed Ichthyotomi or Pleuracanthea, represented by *Pleuracanthus* of the Carboniferous and Permian of Europe. Of the many distinguishing features of this group the most noteworthy is the possession of pectoral fins of the archipterygium type, which many morphologists (Gegenbaur and his school) maintain to be the fin form from which are evolved all other types of paired fins, and even the five-toed limbs of higher vertebrates. In the perfect archipterygium the basals form an axis projecting from the body, while the radials are ranged along this axis in two rows, like the veins of a leaf along the midrib. This type of fin is also common to the lung fishes and some of the most primitive bony fishes. There is strong reason to believe that it is derived from the lappet-like type of the Pleuropterygii. (See FIN.) The elasmobranchs thus far mentioned did not survive beyond the Paleozoic, but it is these early types only which are sufficiently primitive to be of importance in tracing the ancestry of higher vertebrates.

The order Selachii, comprising all the modern sharks and rays, appeared in the Lias, though one family, the cestracionts, may be traceable to the Permian. The basals of the pectoral fin are reduced to two or three pieces, and the blade of all the fins is chiefly dermal. The males are provided with claspers on the pelvic fins. The vertebral centra, with few exceptions, are well developed, and the form of calcification of the vertebræ, i.e., whether radial, in a single ring, or several concentric rings, has been made by Hasse (1879) a criterion for subdivision of Selachii into Asterospondyli, Cyclospondyli, and Tectospondyli, but, like most systems based upon a single character, it is not very satisfactory. A more practical division into suborders is the following: (1) Protoselachii, sharks with more than five (six or seven) gill arches and a number of primitive skeletal characters—extending from Upper Jurassic to recent and including *Heptanchus* and *Chlamydoselache;* (2) Squalida, all five-gilled true sharks; most families appear in the Mesozoic, but the Port Jackson sharks (cestracionts), which have large crushing teeth, possibly originate in the Carboniferous; (3) Rajida, the rays and skates—Mesozoic to recent.

Bibliography. Dean, *Fishes, Living and Fossil* (New York, 1895); Woodward, *Vertebrate Palæontology* (London, 1898); K. A. Von Zittel, *Textbook of Palæontology* (Eng. trans. by C. R. Eastman, 2 vols., New York, 1903).

SHARKING. In some American waters, and particularly along the east coast of Florida, fishing for tarpon and shark is common, and while it is not unattended with danger, it offers the most exciting sport. The white shark (*Carcharis vulgaris*), found in the Mediterranean and other seas of the warmer parts of the world, is caught by means of a great hook, baited by a piece of meat and attached to a chain. In the South Sea Islands the method is to set afloat a log of wood which has a long rope attached to it at the end of which is a noose. It is expected that some curious shark will get his head into the noose and finally be wearied out by the log and thus be forced ashore. The blue shark is caught with a hook and line in the ordinary manner. The basking shark is caught whale fashion with a harpoon.

SHARK SUCKER. A common sucking fish of the remora family (Echeneididæ), found in all warm seas attached to sharks and other large fishes, turtles, and the like and known in Spanish America as pega or pegador. It is named *Echeneis naucrates* and differs from the related remora (q.v.) in its more slender form, more elongated sucking disk, and the fact that the body is ornamented by a broad, dark, white-edged stripe on each side. This species is very

common in the tropics, where few large fish escape them. They readily come to the hook and are very good to eat. Consult C. H. Town-

THE SHARK SUCKER.

send, in *Zöological Society Bulletin*, vol. xviii (New York, 1915).

SHARON, shâr'on (Heb. *shārōn*, probably plain). The broad and uneven plain lying between the hills of Palestine and the Mediterranean and extending from Cæsarea to Joppa. It was once the site of extensive forests, which existed as late as the time of the Crusades and some remains of which still survive. The Greek version (Isa. lxv. 10) calls it the forest. It was prized for its pasturage (1 Chron. xxvii. 29; Isa. lxv. 10) and ranked with Carmel and Lebanon for the luxuriance of its vegetation (Isa. xxxv. 2). Its wealth of flowers, for which it is still noted, is celebrated in the rose of Sharon (Song of Songs, ii. 1), which is now understood to be a narcissus or crocus. Consult G. A. Smith, *Historical Geography of the Holy Land* (16th ed., London, 1910).

SHARON. A borough in Mercer Co., Pa., 75 miles northwest of Pittsburgh, on the Shenango River and on the Pennsylvania, the Lake Shore, and Michigan Southern, the Pittsburgh and Lake Erie, and the Erie railroads (Map: Pennsylvania, A 4). There is a considerable trade in coal, and Sharon is noted for its steel and iron interests. There are rolling mills, boiler and machine shops, furnaces, flour mills, ordnance works, and manufactories of explosives, nails, horse collars, spokes, chains, stoves, and lumber products. It was settled in 1795. Pop., 1900, 8916; 1910, 15,270; 1915, 18,077; 1920, 21,747.

SHARON, Rose of. See Rose of Sharon.

SHARP. A sign (♯) in music which, when prefixed to a note, elevates it by a chromatic semitone. If the note occurs again within the same bar it is again played sharp, unless it is preceded by a natural sign. When the original tone is to be played in the following bar, it is customary to mark it with a natural sign. A double sharp (♯♯) raises the pitch of a note by two chromatic semitones.

SHARP, Abraham (1651–1742). An English astronomer and mathematician, born at Little Horton, near Bradford. From 1676 to 1690 he was employed in Greenwich Observatory. Later he retired to Little Horton, calculating and making astronomical instruments and models, for which he became famous. He was joint publisher with Crosthwait of the *British Catalogue*. He wrote *Geometry Improved* (1717). Consult W. Cudworth, *Life and Correspondence of Abraham Sharp* (Bradford, 1889).

SHARP, Becky. The principal character in Thackeray's *Vanity Fair*.

SHARP, Dallas Lore (1870–). An American author and university professor, born at Haleyville, Cumberland Co., N. J. He graduated at Brown University in 1895 and at the Boston University School of Theology in 1899. After serving for four years as a Methodist Episcopal minister he was assistant librarian (1899–1902), assistant professor of English (1902–09), and thereafter professor at Boston University. As a writer he became known through his charming magazine articles on native birds and small mammals and for his books, which include: *Wild Life Near Home* (1901); *A Watcher in the Woods* (1903); *Roof and Meadow* (1904); *The Lay of the Land* (1908); *The Face of the Fields* (1911); *The Fall of the Year* (1911); *Winter* (1912); *The Spring of the Year* (1912); *Summer* (1913); *Beyond the Pasture Bars* (1914); *The Whole Year Round* (1915).

SHARP, David (1840–1922). An English zoölogist. Privately educated, he was curator of the museum of zoölogy at Cambridge until 1909. He was a president of the Entomological Society of London and became honorary member of entomological societies in France, Germany, Holland, Russia, Washington, and Hawaii. Besides editing the *Zoölogical Record* he wrote *Aquatic Carnivorous Coleoptera* (1882) and the volume on *Insects* in the *Cambridge Natural History* (1895, 1899).

SHARP, Elizabeth Amelia. See Sharp, William.

SHARP, Granville (1735–1813). An English philanthropist. He was born and educated at Durham, taught himself Greek and Hebrew, and in 1758 was given an appointment in the Ordnance Office. He became especially prominent by his interest in emancipation of the negro slave. In 1772 Sharp obtained the decision of the English judges in the famous case of the negro Somerset, that as soon as a slave sets his foot on English ground he becomes free. He resigned office in the Ordnance Department in 1777, in protest against prosecuting the war with the American Colonies. The rest of his life was devoted to the abolition of slavery and to authorship. He wrote *A Declaration of the People's Natural Right to a Share in the Legislature* (1774) and *A Tract on the Law of Nature and Principle of Action in Man* (1809). He established a new rule regarding the use of the definite article in the Greek text of the New Testament. He was one of the founders of the colony of Sierra Leone. Consult Prince Hoare, *Memoirs of Granville Sharp* (London, 1820).

SHARP, James (1613–79). A Scottish ecclesiastic, born at Banff, Scotland, and educated at King's College, Aberdeen (M.A. 1637). He became professor of philosophy in St. Leonard's College, St. Andrews (1643), and five years later minister of Crail, an office he held during the life of Cromwell. In 1656 he was sent to London to plead the cause of the moderate Presbyterians against the radical faction. In 1660, when the restoration of Charles II was imminent, Sharp became the representative of his party in Scotland. His course was doubtless marked by some duplicity, for he had advised and accepted conditions which secured Scotland to episcopacy. He soon became Archbishop of St. Andrews. He was assassinated on Magus Muir by a band of Covenanters. For his career, consult: Thomas Stephen, *Life and Times of Archbishop Sharp* (London, 1839); James Dodds, *Fifty Years' Struggle of the Scottish Covenant* (ib., 1860); *The Lauderdale Papers* (ed. by Osmond Airy, Camden Society Publications, London, 1884, 1885).

SHARP, Martin Andrew. See Hume, Martin Andrew Sharp.

SHARP, William, who wrote also under the

pen name of FIONA MACLEOD (1855–1905). A Scottish poet, novelist, and essayist. He was born at Paisley, Sept. 12, 1855, and was educated at Glasgow University. In 1879 he settled in London, where he became acquainted with D. G. Rossetti, whose biography he wrote (1882). Before turning to the profession of letters he had worked in a lawyer's office in Glasgow and as a bank clerk in London. *The Human Inheritance: Transcripts from Nature and Other Poems*, which he published in 1882, was followed by: *Earth's Voices* (1884); *Romantic Ballads and Poems of Phantasy* (1886); *Sospiri di Roma* (1891); *Vistas* (1894), a series of dramatic interludes. He also wrote lives of Shelley (1887), Heine (1888), Browning (1890), and Joseph Severn (1892); the novels: *A Fellowe and his Wife* (1892), with Blanche Willis Howard; *The Gypsy Christ*, so entitled in America (1895), but published in England (1896) as *Madge o' the Pool; Wives in Exile* (1896); *Silence Farm* (1899); and edited several anthologies and many essays and miscellanies. Sharp led a double literary life and, besides the books published under his own name, wrote several under the pseudonym of Fiona Macleod, which were in a vein quite different from his other work. That part of Sharp's nature which expressed itself in the writings of "Fiona" was quickened to literary activity through the influence of a lady whom he met in Rome in 1890—a lady who, as he said, was to him "a symbol of the heroic women of Greek and Celtic days" and brought him into touch with mystic and romantic "ancestral memories." The secret of Sharp's identity with "Fiona" was long and well kept. A letter, to be communicated to his friends after his death (which occurred in Sicily, Dec. 12, 1905), revealed it and explained the mystification. The mystical and dreamy prose and verse of "Fiona" was distinguished by romantic imagination and by sympathy with the moods of Celtic myth and legend, though educated Highland Celts discovered that "Fiona's" Celtic equipment was neither flawless nor complete. The most notable of the "Fiona" books are: *Pharais: A Romance of the Isles* (1894); *The Sin-Eater and Other Tales and Episodes* (1895); *The Mountain Lovers* (1895); *From the Hills of Dream* (1896); *Green Fire* (1896), a Breton romance; *The Dominion of Dreams* (1899); *The Immortal Hour* (1900), a drama founded on the Celtic legend of Midir and Etain; *The Divine Adventure* (1900); *Through the Ivory Gate* (1901), 10 poems in the *Fortnightly Review; The Silence of Amor* (1902), prose poems; *The House of Usna* (1903). A collection of "Fiona's" contributions to periodicals appeared as *The Winged Destiny* (1904) and another as *Where the Forest Murmurs* (1906). A uniform edition of "her" works was published in England in 1910. Two volumes containing some of Sharp's best critical work and published under his own name appeared in 1912. There is a *Memoir* of Sharp (2 vols., London, 1910–12), compiled by his wife (and cousin), ELIZABETH AMELIA SHARP, who is known also as editor or author of: *Women Poets* (1887); *Sea-Music* (1888); *Lyra Celtica* (1896), an anthology; *Rembrandt* (1904), a monograph. From 1909 to 1911 she was engaged in editing her husband's works (complete, 7 vols.; selected, 5 vols.).

SHARP, WILLIAM GRAVES (1859–1922). An American lawyer, manufacturer, and diplomat, born at Mount Gilead, Ohio. He graduated LL.B. from the University of Michigan in 1881 and then practiced law at Elyria, Ohio. He also engaged in the manufacture of charcoal, pig iron, and chemicals. In 1885–88 he was prosecuting attorney of Lorain Co., Ohio. He was a Democratic presidential elector in 1892, a Democratic candidate for Congress in 1900, and a member of the Sixty-first to the Sixty-third Congresses (1909–15), but resigned in 1914 to become Ambassador to France by appointment of President Wilson.

SHARPE, RICHARD BOWDLER (1847–1909). An English ornithologist, born in London and educated in grammar schools. He was a fellow of the Linnean Society and honorary fellow of the Zoölogical Society, which latter he served as librarian in 1867–72. Later he was senior assistant in the department of zoölogy in the British Museum (1872–95) and thereafter assistant keeper in the subdepartment of vertebrata. He published nearly 400 scientific treatises, mainly on birds, among them *Monograph of the Alcedinidæ* (1869); *Catalogue of Birds in the British Museum* (1874–98), 27 volumes, of which he wrote 13; *Monograph of the Hirudinidæ* (1885–94), with C. W. Wyatt; *Monograph of the Paradisidæ* (1891–98); *Handbook of Birds* (5 vols., 1899–1909).

SHARPE, SAMUEL (1799–1881). An English Egyptologist and translator of the Bible, born in London. His interest in Egyptology was aroused through the works of Thomas Young and Champollion, and he soon became proficient in hieroglyphic studies, as well as in Coptic, in Hebrew, and in Greek. He also paid much attention to biblical studies and published revised translations of both the Old and the New Testament—the former in 1840, the latter in 1865. Of his numerous works the following are the most important: *Early History of Egypt* (1836); *Egyptian Inscriptions from the British Museum and Other Sources* (1837–55); *Rudiments of a Vocabulary of the Egyptian Hieroglyphics* (1837); *History of Egypt under the Ptolemies* (1838); *History of Egypt from the Earliest Times till A.D. 640* (1846; 6th ed., 1876); *Texts from the Holy Bible Explained by the Help of the Ancient Monuments* (1866; 3d ed., 1880). For his biography, consult Clayden, *Life of Samuel Sharpe* (London, 1883).

SHARPLES, shär'p'lz, STEPHEN PASCHALL (1842–). An American chemist, born in West Chester, Pa. He was educated at Pennsylvania State College and Harvard University and served as assistant in chemistry in Lehigh University during 1867–68 and in Harvard during 1868–72. Thereafter he was professionally engaged as an analytical and consulting chemist in Boston and in 1875–93 was also professor of chemistry in Boston Dental College. During 1872–92 he was Massachusetts State assayer and inspector and assayer of liquors. From 1904 he edited the *Genealogical Quarterly Magazine*. He became a fellow of the American Academy of Arts and Sciences. He published *Chemical Tables* (1866) and contributed many articles on his specialties to chemical periodicals.

SHARP'LESS, ISAAC (1848–). An American educator, born in Chester Co., Pa. He graduated at Harvard in 1873, was an instructor at Haverford College from 1875 to 1879, professor of mathematics and astronomy from 1879 to 1884, and dean from 1884 to

1887, when he was made president. In 1915 he received the honorary degree of D.D. from Harvard. He wrote: *Astronomy for Schools and General Readers* (1882; 5th ed., rev., 1912); *English Education in the Elementary and Secondary Schools*, in the "International Educational Series" (1892); *A Quaker Experiment in Government* (1898); *Two Centuries of Pennsylvania History* (1900); *Quakerism and Politics* (1905); *The American College* (1915).

SHARPS, CHRISTIAN (1811–74). An American mechanic and inventor, born in New Jersey. He was the inventor of the Sharps breech-loading rifle for military and sporting uses and made many improvements in other firearms. After many failures he established a manufactory for his firearms at Hartford, Conn., where he accumulated a large fortune.

SHARPS'BURG. A borough in Allegheny Co., Pa., 5 miles northeast of Pittsburgh, on the Allegheny River and on the Pennsylvania, and the Pittsburgh, Cincinnati, Chicago, and St. Louis railroads (Map: Pennsylvania, B 6). It has a rolling mill, foundries, machine shops, and manufactories of varnish, brick, glass, lumber products, wire, hair, felt, and lubricating oil. Pop., 1900, 6842; 1910, 8153; 1915 (U. S. est.), 8843.

SHARPSBURG, BATTLE OF. See ANTIETAM.

SHARP-SHINNED HAWK. See HEN HAWK.

SHARP'SHOOT'ER. In general usage a skilled shot with the rifle. In war it is not unusual to assign such skilled shots to concealed positions from which, at long range, they may pick off staff and other officers. In a special sense, in the United States Army Regulations, a sharpshooter is a grade of rifleman just below that of expert rifleman, the classification being as follows, in the order of merit: expert rifleman, sharpshooter, marksman, first-class man, second-class man, unqualified. (Consult *Small Arms Firing Manual, United States Army, 1913.*) To the sharpshooter is issued a silver badge, consisting of a pin and cross, which is worn on the left breast of the coat. See RIFLEMAN; TARGET and TARGET PRACTICE.

SHARPSHOOTER. A name in the southern United States for certain heteropterous insects which puncture the young bolls and squares of cotton, causing them to wilt. The most abundant of these species is the glassy-winged sharp-

GLASSY-WINGED SHARPSHOOTER.

shooter (*Homalodisca coagulata*), a leaf hopper of the family Cercopidæ, which secretes an abundant supply of honeydew which it ejects from its body in the form of small drops or a spray.

SHARSWOOD, shärz'wụd, GEORGE (1810–83). An American jurist, born in Philadelphia. He graduated at the University of Pennsylvania in 1828 and was admitted to the bar in 1831. In 1845 he was appointed judge of the Philadelphia district court and was the president of that court from 1848 until 1867, when he became associate judge of the State Supreme Court. From 1878 until 1882 he was Chief Justice of Pennsylvania. From 1850 till 1867 he was senior professor of law in the University of Pennsylvania. He published: *Professional Ethics* (1854; 5th ed., 1884); *Popular Lectures on Common Law* (1856); *Sharswood's Blackstone's Commentaries* (1859); *Lectures Introductory to the Study of Law* (1870).

SHASHI, shä'shē', **SHASI,** or **SHASZE.** A river port in the Province of Hupeh, China, on the left bank of the Yang-tse, 110 miles below Ichang (q.v.) (Map: China, K 5). It stands on a sand bank 1 to 1½ miles wide, which separates it from the great swampy depression of Hupeh (q.v.), and is protected from the floods of the Yang-tse by a great embankment many miles in length, begun in the sixth century. Much cotton is grown in the district; spinning and weaving are important home industries, and Shashi is the largest market in central China for native cotton cloth. In 1896 it was opened by treaty to foreign residence and trade. Pop., 80,000. Port of the Prefect Kingchow.

SHAS'TA, MOUNT. A peak of the Sierra Nevada in California, 40 miles from the northern boundary of the State (Map: California, C 1). It is an extinct volcanic cone rising to a height of 14,380 feet. About 1400 feet below the summit is a crater ¾ mile in diameter and 2500 feet deep. The summit is covered with snow and on the north slope are several glaciers. Consult *Picturesque California* (ed. by Muir, New York, 1888), and Muir, *The Mountains of California* (ib., 1911).

SHASTAN, shăs'tan, SHASTIKA, SHASTA, or SASTEAN. One of the numerous small linguistic families of Indians who formerly lived in the California-Oregon region. They called themselves Kŭtikĕkanać. Their home was the region drained by the Klamath River and its tributaries from the western base of the Cascade Range to the point where the Klamath flows through the ridge of hills east of Happy Creek. They extended over the Siskyou Range northward as far as Ashland, Oreg. They now number 1578, the most of them on the Grande Ronde and Siletz reservations in Oregon. The tribal divisions are Hat Creek, Pit River, and Shasta. Consult R. B. Dixon, "The Shasta," in *American Museum of Natural History, Bulletin,* vol. xvii (New York, 1907).

SHAS'TON. See SHAFTESBURY.

SHAT'TUCK, FREDERICK CHEEVER (1847–). An American physician, brother of George Brune Shattuck. Born in Boston, he received his education at Harvard (A.B., 1868; A.M., 1872; M.D. 1873) and settled in his native city in 1875. Joining the staff of his alma mater, he was Jackson professor of clinical medicine from 1888 till his retirement in 1912. His communications to the medical journals appeared in reprints.

SHATTUCK, GEORGE BRUNE (1844–). An American physician and editor, brother of Frederick Cheever Shattuck. He was born in Boston and was educated at Harvard University (A.B., 1863; A.M., 1867; M.D., 1869). Settling in Boston, he practiced there until his retirement in 1911. He was president of the Massachusetts Medical Society and became editor of the *Boston Medical and Surgical Journal* in 1881.

SHAUGHNESSY, shą'ne-sĭ, THOMAS GEORGE, first BARON (1853–). A Canadian railway president. He was born at Milwaukee,

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MOUNT SHASTA

Wis. He learned railway administration with the Milwaukee and St. Paul and the Chicago, Milwaukee, and St. Paul railways between 1869 and 1882. Thereafter he was identified with the Canadian Pacific Railway, successively as purchasing agent, assistant general manager, assistant to the president, vice president and director, and from 1898 as president. He was also made an officer and director in various other railways and industrial and financial corporations. He was knighted in 1901; in 1907 was created K.C.V.O. and received the Order of the Sacred Treasure, Japan; and in 1916 was raised to the peerage.

SHAVLI, shäv'lyĕ (Pol. *Szawle*, Ger. *Schaulen*). A district town in the Government of Kovno, Russia, situated 114 miles northwest of Kovno (Map: Russia, B 3). Its chief manufactures are spirits, flour, and tobacco. Pop., 1910, 22,741, nearly half of it Jewish. In 1915 it was the scene of some engagements between the Germans and the Russians. See WAR IN EUROPE.

SHAW, ALBERT (1857–). An American editor and writer on political science. He was born at Shandon, Butler Co., Ohio, and was educated at Iowa (now Grinnell) College (A.B., 1879) and at Johns Hopkins University (Ph.D., 1884). His first important work was his thesis, *Icaria: A Chapter in the History of Communism* (1884). After editorial work (on the Minneapolis *Tribune*) and foreign study he was appointed in 1890 professor of political institutions and international law at Cornell University, but declined the appointment. Within a year he established and undertook the editorship of the American *Review of Reviews*. His writings include: *Municipal Government in Great Britain* (1894); *Municipal Government in Continental Europe* (1895); *The Business Career in its Public Relations* (1905); *Political Problems of American Development* (1907); *The Outlook of the Average Man* (1907); *Cartoon History of Roosevelt's Career* (1910).

SHAW, ANNA HOWARD (1847–1919). An American woman suffragist leader; also a minister and physician. She was born at Newcastle-on-Tyne, England, but was brought to the United States as a small child. She studied at Albion (Mich.) College in 1872–75, graduated from the Boston University School of Theology in 1878, and received an M.D. from Boston University in 1885. She paid her own expenses through college and university by preaching and lecturing and was pastor of Methodist Episcopal churches in Massachusetts at Hingham (1878) and East Dennis (1878–85). On account of her sex she was refused ordination by the New England Conference and also by the General Conference of the Methodist Episcopal church in 1880, but was ordained by the Methodist Protestant church in the same year, being the first woman to receive ordination from that denomination. In 1885 she lectured for the Massachusetts Woman's Suffrage Association and in 1886–92 was national superintendent of franchise for the W. C. T. U. Dr. Shaw served as national lecturer from 1886 to 1904 of the National American Woman's Suffrage Association, of which she was vice president at large from 1892 to 1904 and then president till 1915, when she resigned to give herself more largely to campaign work for the cause, a field in which she had much success. She was succeeded by Mrs. Carrie Chapman Catt (q.v.). Consult her autobiography, *The Story of a Pioneer* (New York, 1915).

SHAW, J. BYAM (1872–1919). A British figure painter and illustrator. He was born in Madras, India, went to London in 1879, and studied at St. John's Wood School and at the Royal Academy Schools. He began by exhibiting "Rosemary" (1893), "Whither?" (1896), "Love's Baubles" (1897; Liverpool Gallery), and other symbolical paintings in the manner of the Pre-Raphaelites, and rapidly became one of the leaders of the idealogist school in England. His work is distinguished by richness of imagination and quaintness, but his genius is literary rather than artistic. His color, glowing but crude in his early works, grew increasingly harmonious in his series of 40 paintings illustrating the English poets and in 30 "Pictures from the Book of Ecclesiastes" (1903). He also holds high rank as a decorative illustrator, among his best-known works being the illustrations for Browning's *Poems* (1898); *Coronation Book* (1902); *Pilgrim's Progress* (1904); *The Cloister and the Hearth* (1909); Poe's *Tales* (1909).

SHAW, GEORGE BERNARD (1856–). A British critic, dramatist, and Socialist, born July 26, 1856, in Dublin, Ireland, in which city and its environs he passed the first 20 years of his life. His formal education ceased with his school days, in his fifteenth year. For the rest he was self-educated. After leaving school he became a clerk in a land agent's office, a position he abandoned in 1876 to make a literary career for himself in London, with little more than some knowledge of art and music as an equipment. Here closed the first period of his life. His rebellious instincts had expressed themselves at this early hour in a revolt against the creed in which he was born, the social conventions in which he was bred, and the educational institutions in which he was educated.

An unknown Irishman, without friends or money, he labored strenuously for nearly 10 lean years (1876–85)—the second stage of his career—in London, fashioning his keen and dangerous literary weapon. The event of these years was his conversion to Socialism and his association with the Socialist Fabian Society, of which he soon became apologist in chief. In this period he wrote five novels which, though they put next to nothing in his purse, attracted the favorable notice of Stevenson, William Morris, William Archer, and others. These novels were: *Immaturity* (never printed); *An Unsocial Socialist* (serially in the London Socialist paper *To-Day*, 1884; as a book, 1899); *Cashel Byron's Profession* (serially in *To-Day*, 1885–86; as a book, 1886); *The Irrational Knot* (serially in the London Socialist paper *Our Corner*, 1885–87; as a book, 1904); *Love among the Artists* (serially in *Our Corner*, 1887–88; as a book, 1900).

The third period of Shaw's life covers the years 1885–98, in which he was for the most part on the staff of London papers—as art critic on the *Pall Mall Gazette* (1885–88), as musical critic on the *Star* (1888–90) and on the *World* (1890–94), and as dramatic critic on the *Saturday Review* (1894–98). His weekly criticisms in the last-named periodical were recognized as recurring literary events, and he took his place as the most brilliant of British journalists. From the early eighties on, in addition to his journalistic work, he gave himself gener-

ously to Socialistic propaganda by tongue and pen, developing from the cart-tail orator into perhaps the best debater in England and becoming a publicist sure of eager attention throughout the civilized world.

In his fourth period (1892–), which overlaps, backward, by some six years his third period, Shaw is to be regarded as primarily the dramatist. His first play, *Widowers' Houses*, with its Socialistic purpose, was a *succès de scandal* and little more when presented at the Independent Theatre in 1892. A year later *Mrs. Warren's Profession*, directed against the social evil and among the best of Shaw's plays, was written, though not produced until years later, and then, at first, vilified on the charge of immorality. A moderate success with *Arms and the Man* (1894) followed in England and America. In the 10 years between the play just named and *John Bull's Other Island* (1904), which finally established Shaw as a popular dramatist, he wrote about a play a year, scoring no successes. The publication in 1898 of his *Plays Pleasant and Unpleasant* (containing, in vol. i, *Widowers' Houses, The Philanderer*, and *Mrs. Warren's Profession;* and, in vol. ii, *Arms and the Man, Candida, You Never Can Tell*, and *The Man of Destiny*) and, in 1901, *Plays for Puritans* (containing *The Devil's Disciple, Cæsar and Cleopatra*, and *Captain Brassbound's Conversion*) were doubtless cups of consolation. The turning point in his dramatic fortunes was marked by the year 1904, when he had a triumph with *John Bull's Other Island.* Thenceforth praises from distinguished critics abroad, the success of *Candida* in New York, the performance of his plays in several European capitals, hits made by earlier plays till then unproduced, combined to increase his fame and poured a golden stream of royalties into his lap. From 1904 on his dramatic productivity continued at about the rate he maintained in the preceding decade. Specially notable for their English and American successes were *Mrs. Warren's Profession, John Bull's Other Island, Arms and the Man, Candida* (Shaw's finest achievement in comedy), *Man and Superman* (1903; the best concrete exposition of his philosophy of life), *The Doctor's Dilemma* (in the volume containing also *Getting Married* and *The Shewing-Up of Blanco Posnet*, 1911), *Fanny's First Play* (in the volume with *Misalliance* and *The Dark Lady of the Sonnets*, 1911), *Androcles and the Lion* (produced in New York, 1915), and *Major Barbara* (1905; produced in New York, 1915).

In 1914 and 1915, while he stood for the cause of the allies, his pronouncements on the war and his criticism of his government, individually and collectively, aroused wide and deep resentment, though English apologists for his point of view were not wanting.

As a critic of art, music, and the drama Shaw was competent, original, acute, and stimulating, and he championed unpopular but finally victorious causes, as when he defended Whistler and the Impressionists, Wagner, Ibsen, and the drama of ideas. The value of his constructive work, represented by his Socialistic doctrines (see list of writings below), and of his moral doctrines, time must determine. In his destructive criticism of society and its institutions, though biased and extravagant, he displayed fine courage, a sure eye for defects, a trenchant manner, and a powerful and brilliant style. As a pamphleteer—witness his prefaces and essays on social and other problems of the day—he will probably stand highest among the English writers of his time and may be named in the same breath with men like Swift and Defoe. All deductions made, he must be accounted a valuable asset to his generation, thanks to his *Candida*, which may be held the best comedy since Sheridan; to his sheer literary excellence represented by a racy, brilliant, and powerful style; and, in general, thanks to a body of work which as a whole is a potent stimulus to frank speaking and independent thinking. Notable among Shaw's works and not mentioned above are: *Fabian Essays* (ed. by Shaw and with two essays of his, 1889); *The Quintessence of Ibsenism* (1891; revised and brought to death of Ibsen, 1913); *The Impossibilities of Anarchism* (1895); *The Perfect Wagnerite* (1898); *Fabianism and the Empire* (1900); *The Commonsense of Municipal Trading* (perhaps his best contribution to Socialism, 1904); *Dramatic Opinions and Essays* (collected reviews, etc., 1906); *The Sanity of Art* (1908); *Socialism and Superior Brains* (1910); *Pygmalion* (first published in Berlin in German, 1913), a comedy.

Bibliography. Archibald Henderson, *Shaw: His Life and Work* (Cincinnati, 1911), abounding in biographical material; Joseph McCabe, *Shaw: A Critical Study* (New York, 1914), the best study of Shaw's doctrines up to the time of its appearance; G. K. Chesterton, *Shaw* (ib., 1909), though smart and thin, not insignificant; Charles Cestre, *Bernard Shaw* (Paris, 1912); Augustin Hamon, *La Molière du XXème siècle* (ib., 1913); D. Scott, *The Innocence of Shaw* (New York, 1914); John Palmer, *Shaw: Harlequin or Patriot?* (ib., 1915); P. P. Howe, *George Bernard Shaw* (ib., 1915).

SHAW, Henry Wheeler (1818–85). An American humorist, better known as Josh Billings, born at Lanesborough, Mass. He entered Hamilton College, but soon went West, where he remained for 22 years, working on steamboats and farms and finally becoming an auctioneer. Then he settled in Poughkeepsie, N. Y., to pursue his latest calling and began to write humorous sketches for the newspapers. He adopted a kind of phonetic spelling and won great favor in the early sixties. His *Farmers' Allminax*, published annually (1870–80), sold widely, and he also increased his reputation by lectures. Afterward he contributed to the *Century* under the pen name Uncle Esek. Among American humorists Josh Billings holds his own by his pith and point, but he relied unduly for his effects upon crude horseplay and grotesque misspelling, and neither his wit nor his humor is of the finest or deepest. The best of him is probably in *Josh Billings's Complete Works* (1877). Consult the *Life* by F. S. Smith (New York, 1883).

SHAW, James. See Kennedy, Sir J. S.

SHAW, John Balcom (1860–). An American Presbyterian clergyman, educator, and author. He was born at Bellport, N. Y., and graduated at Lafayette College in 1885 and at Union Theological Seminary in 1888. He served as pastor of the West End Church, New York (1888–1904), of the Second Presbyterian Church, Chicago (1904–13), and of Immanuel Church, Los Angeles, from 1913 to 1915, when he accepted the presidency of Elmira College (Elmira, N. Y.). He published: *Four Great Ques-*

tions (1898); *Secret of Soul Winning* (1902); *Where the Shadows Lie* (1902); *The Difficult Life* (1903); *One Step at a Time* (1904); *Soul Rewinning* (1905); *The Work that Wins* (1905); *Life that Follows Life* (1907); *Vision and Service* (1907).

SHAW, Lemuel (1781–1861). An American jurist, born in Barnstable, Mass. He graduated at Harvard in 1800, studied law, and in 1804 was admitted to the bar. The next 26 years he spent in private practice in Boston, rising to a commanding position at the Boston bar. A prominent Federalist, he became a member of the Massachusetts House of Representatives, the State Senate, and the Constitutional Convention of 1820–21. He succeeded Chief Justice Isaac Parker of the Massachusetts Supreme Judicial Court in 1830. His 30 years' service on the bench marked him as one of the great New England jurists. His decisions were made in greatly differing fields of law. Although an ardent antislavery man, his respect for the law caused him, in the famous Sims case (see Sims, Thomas M.), to uphold the constitutionality of the Fugitive Slave Law, the passage of which he had vigorously opposed.

SHAW, Leslie Mortier (1848–). An American lawyer, banker, and cabinet officer, born at Morristown, Vt. For many years after 1869 he was resident in Iowa. He graduated at Cornell College in 1874, and at the Iowa College of Law in 1876, and practiced law at Denison, where he subsequently became interested in banking. In 1896 he became prominent as a Republican campaign speaker and especially as an earnest advocate of the gold standard. From 1898 to 1902 he was Governor of Iowa and thereafter until 1907 served as Secretary of the Treasury in the cabinet of President Roosevelt. In 1909–13 Shaw was president of the First Mortgage Guarantee and Trust Company of Philadelphia. He wrote *Current Issues* (1908).

SHAW, Richard Norman (1831–1912). A British architect, born in Edinburgh. In 1847–54 he studied under William Burn in London, and he attended also the architectural schools of the Royal Academy, whose gold medal and traveling studentship he won, enabling him to travel and study on the Continent in 1854–56. On his return his drawings were published as *Sketches from the Continent* (1858). Beginning practice in 1863, he was for a short time associated with William Eden Nesfield (q.v.). Afterward, until his retirement in 1901, he designed many structures, the more important of these including the following country houses; Leyes Wood, Surrey; Adcote, in Shropshire, one of the finest examples; Flete House, Devonshire; Greenham Lodge, Berkshire; Dawpool, Cheshire; Bryanstone, Dorsetshire; Chesters, Northumberland. The New Scotland Yard, on the Thames Embankment, is regarded as his greatest achievement. In London he also designed the New Zealand Chambers in Leadenhall Street and Lowther Lodge, Kensington. Shaw became an associate in 1872 and full member in 1877 of the Royal Academy.

SHAW, Robert Gould (1837–63). An American soldier. He was born in Boston and was educated in Switzerland and Germany and at Harvard. Upon the outbreak of the Civil War he obtained a commission as second lieutenant in the Second Massachusetts Volunteers. With this regiment he participated in the campaigns of the Army of the Potomac, was an aid on General Gordon's staff at the battle of Cedar Mountain, and distinguished himself at the battle of Antietam. He was promoted captain in 1862, and in 1863 was offered by Governor Andrew the colonelcy of the Fifty-fourth Massachusetts Volunteers, the first regiment of negro troops to be organized under State authority in the North. This commission, although he doubted his capacity and realized the criticism and censure he would have to face for taking command of a negro regiment, he felt it his duty to accept and at once returned to Massachusetts, where he organized the regiment and left Boston with it for the South, May 28, 1863. The regiment was sent on transports to Hilton Head, and its first participation in the war was as part of an expedition to Florida early in June. In July the regiment was attached to General Strong's brigade and took part in the futile and disastrous attack on Fort Wagner. There on the evening of July 18 the Fifty-fourth Regiment, weary and worn from all-night marching and exposure, formed the centre of the attacking column. Against the well-intrenched Confederates, Colonel Shaw gallantly led his negro troops in the face of a withering fire, and himself fell dead on the parapet. He was a man of particularly pure and noble character and of great ability as a soldier. A monument to him, the work of Augustus Saint-Gaudens (q.v. for illustration), was erected on Boston Common. In the same city is a bust of Shaw by Edmonia Lewis, the colored sculptor. Consult *Harvard Memorial Biographies* (Boston, 1866), and R. T. Teamoh, *Sketch of the Life and Death of R. G. Shaw* (ib., 1904).

SHAW, Sir William Napier (1854–). An English meteorologist, born in Birmingham and educated at Emmanuel College, Cambridge, and at the University of Berlin. In the Cavendish laboratory (Cambridge) he was demonstrator of physics in 1880–87 and assistant director in 1898–99, and from 1890 to 1899 was senior tutor of Emmanuel. He was a member of the Meteorological Council from 1897 to 1905, when he became director of the Meteorological Office. After 1907 he was also a reader in the University of London. Shaw was knighted in 1915. Besides contributions on meteorology and electrolysis he wrote: *A Text-Book of Practical Physics* (1884), with Glazebrook; *The Life-History of Surface Air Currents* (1906), with R. G. K. Lempert; *Air Currents and the Laws of Ventilation* (1907); *Forecasting Weather* (1911).

SHAWANO, shȧ-wä′nō, or **SHAWNEE,** shą-nē′ (from *shawan,* south, or *sewan,* pungent, salty). One of the most important tribes of the Algonquian stock (q.v.). The Shawano were formerly noted salt makers. They carried on an extensive manufacture at the salt springs of southwestern Virginia and traded the product to other tribes. They are organized into four divisions, which may have been originally distinct, allied tribes—Piqua, Mequachake, Kiscopocoke, and Chillicothe. To the second of these belonged the hereditary priesthood, but the first was most prominent and apparently most numerous.

The Shawano were of wandering and warlike habit. They appeared first in history about 1670 under the name of Sacannahs and lived upon the middle Savannah River in South Carolina, with their principal village nearly opposite the site of Augusta, Ga., but before the end of

the seventeenth century we find a portion of them, apparently the main body, occupying the basin of the Cumberland River in Tennessee and Kentucky.

The Shawano of Carolina for some time kept on friendly terms with the whites, giving them efficient aid against the hostile Westo in 1680, but finally, wearied by the encroachments and oppressions of the settlers, were forced to withdraw northward. In 1694 almost the whole body of the Carolina Shawano removed northward and settled upon the upper Delaware River in the neighborhood of their relatives and friends, the Delaware and Mohican. About 30 years later they again removed to the Susquehanna River, in the neighborhood of the present Wyoming, Pa., where they were joined in 1742 by the Delaware and Munsee, who had been dispossessed by the Walking Treaty. By 1756 the Shawano had made another westward move and joined their brethren on the upper Ohio, who had come up in the meantime from Tennessee. Up to about 1730 they had still kept up their old village near Augusta, on the Savannah, from which they were finally driven by the Cherokee.

The western Shawano, of the Cumberland region, are first definitely mentioned in the *Jesuit Relations* of 1648 under the name of Ouchaouanag. In 1670, as Chaouanon, they are described as living some distance southeast from their friends, the Illinois. From that time their name appears frequently in the records until their expulsion and removal from the Cumberland between 1705 and 1715 in consequence of a war with the Chickasaw and Cherokee. They retired to the Ohio country, where they united with those who had originally come up from Carolina, establishing their principal villages near the present Piqua and Chillicothe, Ohio. The Shawano took a leading part against the English in the French and Indian War and Pontiac's War and afterward against the Americans in the Revolution, the Tippecanoe campaign, and the War of 1812. In 1793 a considerable body settled in Missouri on lands granted by the Spanish government. The death of Tecumseh broke the spirit of the Ohio tribes, and the war period closed for them with the treaty of peace in 1815. By a rapid series of treaty sales and removals the Shawano were shifted successively, in different bands, to Missouri, Texas, Kansas, and the Indian Territory. Those in Missouri removed to Kansas in 1825 and were joined there by the main body from Ohio in 1831. Some of these, known now as Absentee Shawnee, removed to Oklahoma about 1845, others followed, and in 1867 the main tribe removed bodily and became incorporated with the Cherokee Nation.

The Shawano have always been noted for their strong conservatism, high courage, and superior intellectuality, as exemplified in the life of the great Tecumseh and his brother, the prophet Tenskwatawa. They probably never numbered more than 2500. They number now altogether about 1400 souls, all in Oklahoma. Consult F. W. Hodge, *Handbook of the American Indians* (Washington, 1907). See TECUMSEH; TENSKWATAWA.

SHAWINIGAN (shą'ĭn-ĭ-gan) **FALLS.** A town in St. Maurice County, Quebec, Canada, on the St. Maurice River and on the Canadian Pacific and the Canadian Northern Quebec railways (Map: Quebec, H 5). Falls near the town are 165 feet high and are said to be capable of developing about 200,000 horse power. Pop., 1901, 2768; 1911, 4265.

SHAWL (Pers. *shāl*, mantle). A square or double square of woven fabric, folded in the middle, worn usually by women, occasionally by men. The most famous and beautiful shawls were made from the inner wool of the Kashmir goat. They were made on hand looms and their patterns, which remained unchanged for ages, produced either by weaving or embroidery. Towards the beginning of the nineteenth century the manufacture of imitation Kashmir shawls was begun in Europe and particularly at Paisley, Scotland, where a pure wool shawl was made at a low price. Shawls have been made of nearly all the textile materials. The plaid, which is worn by the Scottish Highlanders, is a kind of shawl whose pattern has given the name "plaid" to all checkered designs. Shawls or rugs for use by passengers on steamships are made from warm wools. A beautiful crêpe shawl is made by the Chinese from a hand-spun silk from which the gum has not been removed. The Barèges shawl, a woolen fabric made at Barèges, France, was also highly valued.

SHAW-LEFEVRE, shą'le-fē'vẽr, CHARLES. See EVERSLEY, VISCOUNT.

SHAW-LEFEVRE, GEORGE JOHN, first BARON EVERSLEY (1832–). An English politician. He was educated at Eton and at Trinity College, Cambridge, studied law, and was called to the bar in 1855. He was a member of Parliament for Reading from 1863 until 1885 and then for 10 years represented Central Bradford. In 1868 he carried the vote in the House of Commons for arbitration of the Alabama claims (q.v.). He was Secretary of the Board of Trade under Mr. Bright (1869–71), Undersecretary in the Home Office (1871), and Postmaster-General (1883–84). In 1881–83 he had been First Commissioner of Works, and this office he held again in 1892–93, with a seat in Gladstone's cabinet. Then for about a year he served as President of the Local Government Board. While in the House of Commons he was chairman of many important committees and commissions. From 1897 he was a member of the London County Council, and in 1906 he was raised to the peerage. His writings include: *Freedom of Land* (1880); *English and Irish Land Question* (1881); *Peel and O'Connell* (1887); *Incidents of Coercion* (1888); *Agrarian Tenures* (1893); *Commons, Forests, and Footpaths* (rev. ed., 1910); *Gladstone and Ireland* (1912); *The Partitions of Poland* (1915).

SHAWL GOAT. See GOAT.

SHAWM (OF., dialectic Fr. *chalemie*, pipe). An old wind instrument, the precursor of the oboe. It had a double reed set in a cupped mouthpiece. By removing the cup and taking the reeds between the lips the oboe originated.

SHAWNEE, shą-nē'. See SHAWANO.

SHAWNEE. A city in Pottawatomie Co., Okla., 37 miles by rail southeast of Oklahoma City, on the Atchison, Topeka, and Santa Fe, the Chicago, Rock Island, and Pacific, and the Missouri, Kansas, and Texas railroads (Map: Oklahoma, E 3). Shawnee is the seat of the Baptist University and the Catholic University and contains a Carnegie library. Railroad shops are situated here, and there are cotton gins, a compress, oil mills, and minor manufactures. Pop., 1900, 3462; 1910, 12,474; 1915 (U. S. est.), 17,225; 1920, 15,348.

SHAW UNIVERSITY. An institution for

the training of colored students, founded at Raleigh, N. C., in 1865. It was established originally as a school for the education of freemen, but has gradually expanded its work until about 15,000 students have been enrolled and about 1200 graduates sent out from all departments. Industrial features have been made prominent from the beginning, and in 1915 the university had one of the finest schools of domestic science to be found for the training of colored young women. The university includes a college, an academy, and departments of medicine and pharmacy. The property is valued at about $400,000, and the endowment is somewhat in excess of $50,000. The total attendance in all departments is about 500. The university is under Baptist auspices. The library contains 5000 volumes. The president in 1915 was Charles F. Meserve, LL.D.

SHAYS, shāz, DANIEL (1747–1825). An American soldier. He was born in Hopkinton, Mass., attained the rank of captain in the Revolutionary War, and after settling in Pelham (now Prescott) was the leader in the western Massachusetts agitation against the State government. (See SHAYS'S REBELLION.) After the dispersion of the insurgents Shays removed to Sparta, N. Y.

SHAYS'S REBELLION. An uprising in Massachusetts in 1786–87. In western Massachusetts the people were weighed down with debts and burdensome taxes, consequent upon the War of the Revolution, and suffered from a depreciated currency. Malcontents, gathered in conventions, began to draw up demands and grievances; committees of correspondence endeavored to rouse the public to action. It was asserted that the merchants were rapidly draining the State of specie, that taxes were unnecessarily high, that lawyers' fees were exorbitant, and that the courts were used as instruments of oppression. The complainants clamored for the issue, in large quantities, of paper money, for salary retrenchment, for the abolition of the Court of Common Pleas, and for a radical reduction of taxes. In the summer of 1786 the situation became critical, and the discontented, headed by Daniel Shays (q.v.), everywhere threatened violence. At Northampton, Worcester, Great Barrington, and Concord armed mobs prevented the sitting of the courts. In spite of General Shepard and 600 militia Shays with 600 followers broke up a session of the Supreme Court at Springfield (September, 1786). Notwithstanding concessions from the General Court, disturbances continued, and Governor Bowdoin organized a force of 4400 militia, under command of Gen. Benjamin Lincoln. On Jan. 25, 1787, Shays with 2000 men marched into Springfield to seize the Federal arsenal there, but was confronted by Shepard with a force of 1200. At the first serious fire the insurgents lost courage and fled. Some miles away they were overtaken and dispersed by Lincoln. Minor skirmishes occurred in Berkshire, notably the one at Sheffield, Feb. 26, 1787, but the insurgents soon disbanded. Fourteen of the leaders were sentenced to death for treason, but were subsequently pardoned by Governor Hancock. Consult Minot, *History of the Insurrections in Massachusetts in 1786, and the Rebellion Consequent Thereon* (Boston, 1810), and Holland, *History of Western Massachusetts* (Springfield, 1855).

SHEA, shā, SIR AMBROSE (1818–1905). A British-American administrator. He was born at St. John's, Newfoundland, and engaged in mercantile pursuits. He was elected a member of the Newfoundland Legislative Assembly in 1850, was Speaker thereof in 1855–61, and a member without portfolio of the Executive Council in 1864–69. He was a delegate from Newfoundland to the Quebec Conference of 1864 which discussed the terms of Canadian Confederation. In 1883 he was commissioner from his native colony to the Fisheries Exhibition at London, England. He was Governor of the Bahama Islands in 1887–95. In 1883 he was knighted (K.C.M.G.).

SHEA, JOHN DAWSON GILMARY (1824–92). An American historian, born in New York. He was admitted to the bar, but gave himself chiefly to historical research, mainly in connection with French colonization and Jesuit missions in America. He edited the *Historical Magazine* (1859–65). Among his many books are: *The Discovery and Exploration of the Mississippi Valley* (1853); *History of the Catholic Missions among the Indian Tribes of the United States* (1854); *Early Voyages Up and Down the Mississippi* (1862); *Novum Belgium: An Account of the New Netherlands in 1643–44* (1862); *The Operations of the French Fleet under Count de Grasse* (1864); *Life of Pius IX* (1875); *The Story of a Great Nation* (1891). Mention should also be made of his *History of the Catholic Church in the United States* (nearly completed at his death), as well as of his Indian grammars, translations of Charlevoix and similar writers, and his editions of early American historical tracts.

SHEA (shē'â) **BUTTER TREE.** See BUTTER TREE.

SHEAFFE, shēf, SIR ROGER HALE (1763–1851). A Canadian soldier and administrator. He was born in Boston, Mass., became an ensign in the British army in 1778, served in Ireland (1781–87), in Canada (1787–97), in Holland and in the expedition to the Baltic (1799–1801), and again in Canada in 1802–11 and 1812–13. He had a prominent part in the War of 1812, assumed command of the British and Canadian troops after the death of Sir Isaac Brock at the battle of Queenston Heights, retook the captured town of Queenston, and won a victory over the invaders. He administered the government of Upper Canada in 1812–13 and was promoted lieutenant general in 1821 and general in 1828. In 1813 he was made a Baronet. He died in Edinburgh.

SHEAR, CORNELIUS LOTT (1865–). An American plant pathologist, born at Coeymans Hollow, N. Y. He graduated from the New York State Normal School (Albany) in 1888, from the University of Nebraska in 1897, and from George Washington University (Ph.D.) in 1906. In 1905 he studied plant pathology and mycology in Munich, Berlin, Leyden, and London. In the employ of the United States Department of Agriculture he was special field agent in 1895–97, assistant agrostologist from 1898 to 1901, assistant pathologist in 1901–02, and thereafter pathologist. He edited the *Asa Gray Bulletin* from 1898 to 1900, served as associate editor of the *Plant World* in 1900–05, and was one of the editors of *Phytopathology* after 1911. In 1908 Shear was president of the Botanical Society of America.

SHEARD, shērd, CHARLES (1857–). A Canadian physician. He was born in Toronto

and was educated at Upper Canada College and Trinity University. He practiced his profession in his native city. He was medical health officer of Toronto in 1893–1910, president of the Ontario Health Officers' Association in 1896, and chairman of the Provincial Board of Health in 1909. In 1892 he was elected president of the Canadian Medical Association.

SHEARING MACHINE. See METAL-WORKING MACHINERY.

SHEARMAN, shēr'mȧn, THOMAS GASKELL (1834–1900). An American lawyer. He was born in Birmingham, England, emigrated with his parents to New York in 1843, settled in Brooklyn, and was admitted to the bar in 1859. At first he devoted himself almost exclusively to writing books on law. In 1868 he entered the law office of D. D. Field and later was successful in practice. In 1874 he undertook the defense of his friend Henry Ward Beecher in the celebrated suit brought by Theodore Tilton. In his later years he was an ardent supporter of the economic doctrines of Henry George. With Tillinghast he wrote *Practice, Pleading, and Forms* (1861–65) and with A. A. Redfield *A Treatise on the Law of Negligence* (1869; 6th ed., 1913). Among his other books are: *Talks on Free Trade* (1881); *Distribution of Wealth* (1887); *Owners of the United States* (1889); *The Coming Billionaire* (1890); *Crooked Taxation* (1891); *Taxation of Personal Property* (1895); *Natural Taxation* (1895; 3d ed., 1898). For the New York Code Commissioners he prepared the *Book of Form* (1860) and most of the *Civil Code* (1862–65).

SHEARS. See CRANE; CUTLERY.

SHEAR'WA'TER, or HAGDEN. A petrel of the genus *Puffinus,* differing from other petrels in having the nostrils opening separately and divided by a very thick partition. Shearwaters spend their lives mostly on the ocean, skimming the waters with very rapid flight and plunging into them for their food. They rarely visit the shore except for the purpose of incubation. All are sooty brown above and white below with various specific markings. The greater shearwater (*Puffinus major,* or *gravis*), about 18 inches long, wanders over the whole Atlantic Ocean and is abundant on the coasts of Newfoundland. The Manx shearwater (*Puffinus puffinus*) is found also in more northern regions, but is very rare on the coasts of North America. It is about 14 inches long, grayish black, the neck mottled with gray, the throat and all the underparts white. Like all the others it breeds on islets, in rabbit burrows, or in crevices of the rocks and lays one or two white eggs. There are numerous other species in various parts of the world, one of which (*Puffinus brevicaudus*) is well known about Australia as mutton bird.

SHEAT'FISH' (AS. *scēota,* trout), or SHEATHFISH. The great catfish, wels or silurus (*Silurus glanis*), of the rivers and lakes of northern Europe, east of the Rhine, sometimes 12 feet long. It is bluish black above, spotted with olive green, and the underparts are dull white with black markings. It feeds on aquatic animals and will pull down ducks and other swimming birds. It is the largest fresh-water fish in Europe. Cf. CATFISH, and see Plate accompanying that article.

SHEATH'BILL'. A curious Antarctic bird of the family Chionidæ, which looks like a pigeon, but is now decided to be limicoline. The thick, fowl-like beak is covered by a horny sheath, extending up to the eyes, and is bare and caruncu-lated, but the forehead is densely feathered. Two species are known, *Chionis alba* of the Falkland and other Antarctic islands, with the sheath of the bill yellowish, and *Chionis minor* of Kerguelen Island, smaller and with the sheath black. Both have white plumage and feed upon mollusks, crustaceans, and animal substances found along the beach, and both are called sore-eyed pigeons by sailors.

SHEATH'ING (from AS. *scæþ,* sheath). The covering of a ship's hull, usually of metal. In the days of wooden ships it was found that barnacles and other marine parasites attached themselves so firmly to the bottom as to necessitate injury to the wood in dislodging them; moreover, some marine animals (e.g., the teredo) bored into the wood and destroyed it. Sheathing with very hard wood was first resorted to. Lead sheathing seems to have been used as early as 1620 at least and was probably used to cover the wood along the water line several centuries before. A Japanese junk of about 800 tons sheathed with iron was seen in 1613. In 1761 copper was first used as sheathing, and in course of time copper or a copper alloy displaced all the other metals except zinc, which is still, though rarely, used. When iron ships were built it was noticed that their bottoms became foul very quickly. The best remedy found was paint, and it was only a partial one. To avoid excessive fouling some iron and steel vessels of war had their bottoms sheathed with wood and coppered as in the days of wooden ships, but the practice has now been entirely abandoned. Iron merchant vessels have rarely been sheathed. Zinc sheathing was used to some extent because in the electric action between the zinc and iron it is the zinc which is eaten away. The bottoms of ships are generally cleaned every year or oftener (once in six months is desirable) and coated with two kinds of paint. The first is anticorrosive and is designed to protect the metal against rusting. The other is antifouling. It is much softer than the other paint, is poisonous to marine growths, and if any adhere to it they are apt to be washed off together with a thin film of the paint. No paint yet devised is regarded as fully satisfactory, but several varieties give fairly good results for five or six months. See PAINTS.

SHEAVE. See BLOCK; TACKLE.

SHE'BA (Heb. *Shĕbā,* Ar. *Saba,* Assyr. *Sab'u*). Hebrew eponym of the Sabæan people, represented in Gen. x. 28 as one of the 13 (originally 12) sons of Joktan, Eber's son: in Gen. xxv. 3 as a son of Jokshan, Abraham's son by Keturah; in Gen. x. 7 as a son of Raamah, Ham's grandson. That some Sabæans were made Hamites may be due to the knowledge of Sabæan settlements along the caravan route from Meroë to the Erythræan Sea. The desire to make Abraham the father of a multitude of peoples accounts for the divergent genealogy in Gen. xxv. 3. Sheba is correctly associated with southwest Arabian tribes in the oldest documents. In 1 Kings x. 1 et seq. there is a story of a visit to Solomon by a queen of Sheba not mentioned by name. It is quite possible that such a queen, cherishing designs to wrest the ancestral home in Yemen from the Minæans (q.v.), should have sought alliance with Solomon, who on the Elamitic Gulf was the neighbor and rival of the Kingdom of Main. In this way a nucleus of historic fact may be as-

sumed. Legendary embellishments naturally began at an early date, and the notion of the riddle may go back to Hebrew antiquity. According to the late Arabic version of the story the queen's name was Balkis, and it was Solomon who visited her in Yemen, where she tried him with many riddles. From the Hebrews or the Arabians the Abyssinians learned the story. They give the name of the Queen as Makeda and maintain in their lists of kings that Ibn al Hakim was the son of Makeda and Solomon, and that consequently the legitimate rulers of Abyssinia are Solomonids. Frankincense from Sheba is referred to in Jer. vi. 20 and Job vi. 19. Sabæans appear in caravans; in Ezek. xxv. 22 they are mentioned with Raamah as traders in jewels, balms, and gold; in Isa. lx. 6 they bring gold and incense. See SABÆANS.

Bibliography. Stade, *Geschichte des Volkes Israel* (Berlin, 1889); Glaser, *Geschichte und Geographie Arabiens* (ib., 1890); Winckler, *Geschichte Israels*, vol. ii (Leipzig, 1900); Gunkel, *Genesis* (3d ed., Göttingen, 1910). For the story of Balkis, consult Brünnow, *Chrestomathy of Arabic Prose Pieces* (Berlin, 1895); for the story of Makeda, consult Prætorius, *Fabula de Regina Sabæa apud Æthiopes* (Halle, 1870); on the occurrence of the name Shabat in Egyptian inscriptions of the Persian and Greek period, consult W. Max Müller, in *Mittheilungen der vorderasiatischen Gesellschaft* (Berlin, 1898).

SHEBOYGAN, shê-boi'gan. A city and the county seat of Sheboygan Co., Wis., 52 miles north of Milwaukee, at the mouth of the Sheboygan River, on Lake Michigan and on the Chicago and Northwestern Railroad (Map: Wisconsin, F 5). It has a public library and a handsome Federal building and courthouse. Other features are the Sheboygan County Chronic Insane Asylum, St. Nicholas Hospital, the State Fish Hatchery, and the Sheboygan Home for the Friendless. The shipping point for a farming and dairying region, Sheboygan also has important fishing and industrial interests. There are large cheese warehouses and large coal and salt docks. According to the census of 1914 the various manufactories had an invested capital of $21,481,000 and an output valued at $17,509,000. The principal establishments are chair, furniture, enamel-ware, and toy factories, foundries and machine shops, bottling works, brickyards, breweries, and manufactories of excelsior wrappers, carriages, pianos, leather, beehives and beekeepers' supplies, leather gloves and mittens, knit goods, etc. **Pop., 1900,** 22,962; **1910,** 26,398; **1915 (U. S. est.),** 28,211; **1920,** 30,955.

SHECHEM, shē'kĕm (Heb. *Shĕkem*, the back). An ancient city of Palestine, in the centre of Mount Ephraim, the modern Nabulus (Map: Palestine, C 3). It lay between the mountains of Ebal and Gerizim, in a fair and well-watered valley, which is the meeting place of several natural lines of roads. The mountain of Sakama is mentioned in Papyrus Anastasi I, 22, 6. The city is connected with the traditions of Abraham (Gen. xii. 6) and Jacob, the latter's sons taking it with the sword (Gen. xxxiv). In the Hebrew invasion the Joseph tribes and Joshua move immediately upon Shechem, which becomes the first Israelite centre and is made a city of refuge (Josh. xxiv. 1; xx. 7). These traditions mention a certain holy tree, doubtless an ancient sanctuary, which was adopted by the Hebrews, as were also the sacred traditions connected with Ebal and Gerizim (q.v.). Shechem appears in the story of Abimelech (Judg. ix), but suffered eclipse through the Philistine wars and the rise of Jerusalem. Under Rehoboam the national assembly was held at Shechem, at which the disruption of the Kingdom took place (c.953 B.C.), and Jeroboam I made it his capital. It later yielded to Tirzah and Samaria. It rose again into prominence through the Samaritan schism in the fifth century B.C., becoming the centre of that sect, which erected a temple upon Gerizim as a rival to that in Jerusalem. (See SAMARITANS.) The temple was destroyed by John Hyrcanus in 129 B.C. It suffered in the later Jewish wars and was rebuilt by Vespasian as Flavia Neapolis; hence its modern name Nabulus (q.v.). The last revolt by the Samaritans was put down by Justinian in 529 A.D. The Crusaders under Tancred captured the town, and Baldwin II (1118–31) held a great diet here. The city has now about 27,000 inhabitants. Consult the *Palestine Exploration Fund Memoirs*, vol. ii (London, 1881); G. A. Smith, *Historical Geography of the Holy Land* (16th ed., ib., 1910); Baedeker, *Palestine and Syria* (5th ed., Leipzig, 1912).

SHECHINAH, shê-kī'nâ. See SHEKINAH.

SHEDD, WILLIAM GREENOUGH THAYER (1820–94). An American theologian, born at Acton, Mass. He graduated at the University of Vermont in 1839 and at Andover Seminary in 1843. He was professor of English literature in the University of Vermont (1845–52) and professor at Auburn (1852–53), Andover (1853–62), and Union (1863–90) seminaries. He was a champion of rigorous orthodoxy. For a year (1862–63) he served as pastor of the Brick Presbyterian Church, New York. His works include: *History of Christian Doctrine* (1865; 8th ed., 1884); *Homiletics and Pastoral Theology* (1867); *The Doctrine of Endless Punishment* (1886); *Dogmatic Theology* (3 vols., 1889–94); *Orthodoxy and Heterodoxy* (1893); *Calvinism Pure and Mixed* (1893).

SHEE, SIR MARTIN ARCHER (1769–1850). A British portrait painter and author. He was born in Dublin and studied there under Robert Lucius West and in London under Sir Joshua Reynolds. In 1800 he was made a member of the Royal Academy, of which he became president in 1830. He was a portrait painter of great popularity, though inferior in grace and vigor to his rival, Lawrence, and is especially well represented in the National Portrait Gallery. Among his sitters were many members of the royal family and the theatrical profession. He wrote *Rhymes on Art* (1805) and other poems, also novels and a tragedy, *Alasco* (1824).

SHEEHAN, shē'an, PATRICK AUGUSTINE (1852–1913). An Irish clergyman and novelist, born at Mallow, County Cork, and educated at St. Colman's College, Fermoy, and at Maynooth. He held Roman Catholic pastorates, between 1875 and his death, in Plymouth, England, and at Mallow, Queenstown, and Doneraile. In 1903 he was made canon of Cloyne. Though he wrote miscellaneously—fiction, essays, lectures, etc.—he is best known as a novelist of the Irish Literary Revival. (See IRISH LITERATURE, *Irish Literature in English.*) He is frankly Catholic. Weak in structure, diffuse, and a trifle provincial, his novels are, however, highly interesting as pictures of the Irish priesthood of the author's day seen in its most favorable and pleasing light, and interesting also as

the work of a talented story-teller who knew how to present faithfully national types of character and the phases of Irish life with which he was familiar. Among his books are: *My New Curate* (1899); *Luke Delmege* (1901); *Early Essays and Lectures* (1906); *Lisheen* (1907); *Parerga* (1908); *The Queen's Fillet* (1911); *Miriam Lucas* (1912); and the posthumous *Graves at Kilmorna* (1915).

SHEEP (AS. *sceap*, sheep). A hornless or hollow-horned ruminant belonging to the genus *Ovis* and covered with a fleece of wool varying in color, length, fineness, and strength of the fibre. The male is designated a ram or buck (or wether when castrated), the female a ewe, and the young a lamb. The principal products are wool, meat, and sheepskin. The entrails are used for sausage casings or, when dried and twisted, for musical instrument strings (catgut); the fat yields tallow and suet; and the milk in some countries is used, either alone or with cow's milk, for making cheese (q.v.). Flocks of special milk breeds are kept primarily for their milk. In mountainous parts of India sheep are used as beasts of burden. See PACK TRANSPORTATION.

Sheep have contributed largely to the wealth and development of every country where man has introduced them as adjuncts of settled agriculture. Although they flourish best in temperate climates, they readily adapt themselves to changed climatic and other conditions, and breeds have been developed which thrive from the sea level to the mountain heights and upon a great variety of soils and vegetation.

Sheep are supposed to have been developed from wild forms to which they are related, but opinions differ as to their progenitors. They are most commonly thought to have descended from the mouflon, the musimon, or the argali. No domesticated sheep were found in North America by the early explorers. The wild Rocky Mountain sheep has neither been successfully domesticated nor crossed with the domestic sheep. Under domestication, due partly to differences in altitude, climate, feed, etc., and partly to man's intervention, many breeds and varieties of sheep have been produced.

Breeds. Sheep are commonly classified according to their fleece into long-wooled, middle or medium-wooled, and short or fine-wooled breeds. (See WOOL.) The long-wooled breeds, e.g., Leicesters, Lincolns, and Cotswolds, are usually white-faced, somewhat coarse-fleshed and lethargic, and are of English origin. The Leicester is of special historic interest because it was the first breed to be improved by skillful selection and breeding and because it has been used in improving all the other long-wooled breeds. This breed, whose progenitors were the long-wooled sheep of the Midland counties of England, owes its origin to Robert Bakewell, who developed it purely by selection with reference to a definite mental standard and apparently without resorting to crossing with other kinds or breeds. This Improved Leicester, which has persisted practically as Bakewell developed it, is a hornless sheep, with a somewhat lashy wool 7 or 8 inches long, terminating in a short twist which gives it a fine curly appearance. The animal is somewhat smaller than the original type, but is more symmetrical, thicker, deeper, of better fattening qualities and earlier maturity. Bakewell made no attempt to improve the wool, and the pure-bred stock tends to produce a very fat mutton, which is not now in demand. The great value of the breed lies in its use for crossing purposes. The Border Leicesters, regarded as a separate breed, differ from the Leicesters chiefly in the shape of the head, which is bald, the Leicesters usually having a tuft of wool on the head. The Lincoln resembles the Leicester in general form and might almost be mistaken for it, although it is larger, being the heaviest sheep in the British Isles. The bright, lustrous wool, which masses in characteristic flakes or strands, is extraordinarily long, samples measuring 21 inches. The breed is the product of Leicester crosses upon the old Lincoln stock. As a mutton sheep it is considered by many inferior to the Down breeds, but for crossing purposes it is in great demand, especially on the sheep ranges of the northwestern United States. The Cotswold, one of the most ancient, best known, and most popular of the recognized English breeds, originated on the bleak hills and uplands, where it developed a hardihood and an ability to rustle less evident in other long-wooled breeds. The head is wedge-shaped, without horns, the face covered with white hairs, the lips black, the ears long and pendulous, and the forehead covered with a flowing topknot—one of the most characteristic features of the face. The fleece is long and heavy, although inferior in both respects to that of the Lincolns. The breed has been used in establishing several crossbreeds. The Black-faced sheep and the Herdwicks are mountain breeds, often horned, having long, rather coarse or hairy wool. They are not, however, commonly classed with the long-wooled breeds.

The medium-wooled breeds include the Down sheep, which inhabit the chalk hills of southern England, the Shropshires, and the Dorset Horned. All except the last are hornless, and the face in several breeds is dark brown to black. The Southdown, or Sussex, one of the purest of the English breeds, antedates William the Conqueror. It has been developed by selection, and not by crossing with other breeds, and has been used to improve the dark-faced Down breeds. The horns, which it originally had, have long since disappeared. It has fine short wool, which extends to the forehead and face, and has long been renowned for its mutton, which is close-grained, tender, dark, and juicy. It is a rather small sheep, but its size has been increased by selection. On account of its beauty and highbred appearance it is a favorite for country estates and parks, especially in England. The Shropshire is a crossbred sheep. The original stock was small, horned, and had a black, brown, or spotted face. The improvement consisted in crossing with the Leicesters, the Cotswolds, and the Southdowns. The breed to-day is a striking illustration of the stage of perfection which can be attained by judicious crossing and selection. The carcass is large, covered with a dense elastic fleece of good length and medium fineness, the face is rich brown, and the head covered with a close-fitting cap of wool. The breed is a very popular one and readily adapts itself to various climates and scanty pastures. The Improved Hampshire Down is the heaviest of all the Down breeds, the Oxfordshire Downs vying with it in this respect. The face is dark, the lips black, the ears rather long, often falling slightly forward, the shanks rich dark brown,

SHEEP

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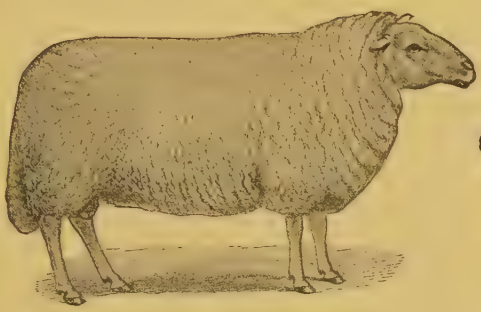

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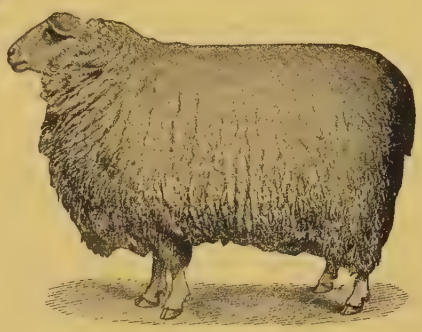

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1. SHROPSHIRE RAM.
2. SOUTHDOWN RAM.
3. CHEVIOT RAM.
4. LINCOLN RAM.
5. RAMBOUILLET RAM.
6. COTSWOLD RAM.

WILD SHEEP AND MUSK OX

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1. HORNS OF PAMIR SHEEP, front view. See No 4.
2. KAMTCHATKAN ARGALI (Ovis nivicola).
3. ROCKY MOUNTAIN BIGHORN (Ovis Canadensis).
4. PAMIR SHEEP (Ovis Poli).
5. MERINO RAM.
6. MUSK OX (Ovibos moschatus).

the fleece white, thick, covering the top of the head, and made up of fine strong fibres. The animals mature early, and the lambs make very rapid growth and fatten early. They respond to good feeding and stand close folding, being in their native country very often hurdled upon pasture crops. The Oxfordshire Down originated about 1833 by crossing the Cotswold on the Hampshire Down and was known prior to 1859 as the Down-Cotswold. By careful breeding it has become a distinct race. These sheep have dark-brown faces, long, thin ears, and a comparatively close fleece, the wool, which covers the head, being longer and more flowing than upon the Shropshire, which it resembles somewhat closely. The Suffolk Downs resemble the preceding, but have very black faces and lack wool between the ears. They were derived from the small and hardy horned Norfolk and Suffolk sheep and have been greatly improved by the Southdown. The Dorset, or Dorset Horned, an English breed, is a survival of a white-faced, horned, short-wooled race, which has descended unmixed from a remote period. It is rather larger and longer in the legs than the Southdown. These sheep are unusually prolific and produce their young so early that the lambs may be sent to market before those of most other breeds. They are hardy, quiet, good feeders, and readily adapt themselves to new conditions. The Cheviot is an ancient, white-faced, hornless, short-wooled sheep, reared in the Cheviot Hills and belonging to the mountain breeds, in which class it is unexcelled.

The foundation of the present fine-wooled sheep of all countries is the Spanish Merino, a type which antedates the Christian era. These sheep were held in Spain by the kings, the nobles, the clergy, and others, and since their exportation was prohibited and extreme care was bestowed upon the fleece, Spain long controlled the fine-wool trade of the world. Among the families of the Merinos were the Escurial, Infantado, Paular, Negretti, Guadaloup, and Aguirres, which for years contributed largely to the support of the Spanish government. Until the nineteenth century, it is said, none were exported except by royal favor or by smuggling. In 1765, 300, introduced into Saxony by royal courtesy, became the foundation of the Saxon Merinos. During the first quarter of the nineteenth century Spanish Merinos were introduced into the United States, and from these the American and the Delaine Merinos have been developed. The moist climate of Great Britain is unfavorable to the growth of the finest wools, and hence the Merino has never been successfully propagated there. It formed the basis of the vast flocks of Australia and New Zealand. The fleece covers the whole body, down to the hoofs and nearly to the tip of the nose. The rams have wide, wrinkled horns. The short, full neck is covered with heavy folds of skin in both males and females. Merino mutton is of inferior quality. The Rambouillet, or French Merino, which originated from the Spanish stock imported by Louis XVI and is named from his estate, is regarded as a distinct breed.

Iceland sheep are remarkable for frequently having three, four, or five horns, as do also some sheep of northern Russia. The broad-tailed or fat-tailed sheep, found in many parts of Asia, are chiefly characterized by the enormous accumulation of fat on each side of the tail bone. The tail is esteemed a great delicacy, and to protect it from being injured by dragging on the ground it is sometimes supported by a board or small pair of wheels. The fat of the tail is often used in place of butter. The fat-rumped sheep of Tartary have similar accumulations of fat on the rumps, falling down in two masses behind and often concealing the short tail. The Astrakhan or Bokharian sheep have very fine wool twisted in spiral curls. The specially beautiful pelts of very young or still-born lambs of this variety are known as Astrakhan fur and are used for trimming garments. These sheep have been introduced into portions of the United States and Canada, with a view to encouraging the home production of the fur.

Sheep Raising was originally and to a large extent has continued a pastoral industry; and because sheep can thrive upon scanty vegetation and succeed best when given free range, they are popular in countries where land is cheap and pastures abundant, and where the industry can be carried on extensively, as in South American countries (notably Argentina), Australia, New Zealand, the western United States, portions of Russia, and South Africa.

In the United States sheep raising has undergone many changes, due to the prices and demands for certain qualities of wool (q.v.) and mutton, the tariff, and other conditions. The census of 1900 showed a total of nearly 62,000,000, that of 1910 about 53,000,000, and the estimate for Jan. 1, 1916, 49,162,000. Among the causes that have contributed to the diminution of number of sheep are the scarcity of labor required for their care, the high prices of sheep and lambs for slaughter, the displacement of sheep by expanding dairying, deficient pasturage and forage on account of drought, destruction by dogs, the settlement of range land previously occupied by sheep, the low price of wool, and the increased value of land. Of the total number in 1914 nearly 55 per cent were on farms and ranges in the western division of the country. Wyoming headed the list, with 4,500,000 head, followed by Montana, Ohio, New Mexico, Idaho, Oregon, California, etc.

The growing appreciation and the increased demand for lamb and mutton in the United States has increased the revenue from flocks, and has resulted in changes in the kind of sheep kept. As an indication of the increase in lamb and mutton consumption, the reports of the Union Stock Yards at Chicago may be cited. In 1885 about 1,000,000 sheep were received for slaughter, in 1890 a little over 2,000,000, in 1900 about 3,500,000, and in 1914 over 6,000,000. A large proportion of these came originally from the sheep ranches of the West, although many were fattened farther east. In 1870 more than four-fifths of the sheep in the United States were either pure-bred or grade Merinos. During recent years there has been a marked tendency to increase the mutton breeds or crosses having better mutton qualities. In the States east of the Mississippi River the coarse or medium-wooled mutton breeds have gradually gained prominence because, as population has increased, meat has become more important than wool. In the Southwest the Merinos still predominate, being held by some to be better rustlers; but in the Northwest the aim of the majority of sheep raisers is to breed a general-purpose animal, with wool of medium fineness, shearing seven to eight pounds, and of good mutton qualities. This is usually brought about

by crossing the Merino or Rambouillet with the Cotswold or Lincoln, pure-bred stock, especially bucks, being the foundation of the flocks on the better ranches. A recent importation of Corriedale sheep to that section from New Zealand will probably furnish a basis for the production of the type of general-purpose animal desired.

The management of sheep under range conditions differs widely from that adopted in the Eastern States or in older countries. Formerly the sheep were kept almost entirely upon the public domain, but with the increasing competition for this open range and the settling of the country, the practice of owning or leasing land has become very common. In many cases immense tracts of land are acquired by lease or purchase, and this usually means the control of a much larger tract. The leased tracts are inclosed with fence, and are supplied with facilities for watering the stock. Generally, however, the sheep raiser does not own or lease all the land required for range, but relies upon the open ranges and the forests in the mountains for summer grazing. These tracts are rapidly diminishing, and grazing in the national forests is now restricted, fees being charged for the privilege. The land which he controls is the winter range, and is usually located in proximity to the headquarters of the ranch. On the range the bands number from 1500 to 3000 sheep, depending upon the character of the country. Each band is in charge of a herder, assisted by dogs which prevent the sheep from straying away and guard them at night. Camp tenders supply the herders' wants and maintain a lookout for good range. In the fall the sheep are brought to the winter range, which is more protected from the snow and has not been fed down during the summer. If no provision is made for feeding, when storms prevent ranging heavy losses are likely to occur. The best sheep men put up alfalfa (q.v.) or prairie hay for such emergencies, and some even plan to fatten the sheep somewhat during winter by this extra feeding, to prepare them for the market.

In the early days buildings were rarely used, but experience has shown that while they are not absolutely essential, increased profits are secured and the business made more certain by providing protection for the sheep, especially during lambing time. This protection usually consists of rough sheds 50 or 75 feet wide and often 200 feet long. Corrals, usually without cover, are located at various points over the winter range, and the sheep are placed in these over night. The more substantial feeding corrals are located near the ranch house. They are usually connected with open sheds in which the sheep may seek protection against snow and rain.

In the spring after lambing time the sheep are sheared, either by hand or with machine, and usually dipped as a precaution against ticks and disease, before they are taken out upon the summer range. In the Western States shearing is carried on by shearers who begin in early spring in Texas and Arizona, where two annual shearings are made. As the season advances they travel northward to Montana, where the work ends in early July. They become so expert, and shear with such rapidity, that an average of from 90 to 120 sheep a day is usual. The maximum record is about 250 sheep in a day. Since about 1895 machine shearing has progressed rapidly, because more wool, an evener fleece, and less injury to the sheep's skin are secured. The motive power is usually a gasoline engine, and shearing plants are constructed which contain from 10 to 40 clippers. No sorting of the wool is done on the ranch, except that the wool of black sheep is sacked separately, since it brings a higher price. It is conceded that the American method of preparing wool for market is behind that used in Australia and New Zealand, and as a consequence the adoption of the so-called Australian system of shearing and classifying wool is being agitated.

The cost of managing sheep under range conditions necessarily varies within rather wide limits. If the sheep raiser makes use of the public lands without paying rental and taxes, and does not practice winter feeding, the business may be conducted at a cost of from 60 to 75 cents per head per year. On the other hand, sheep raisers who maintain extensive plants, feed in winter, and rent or own much of their grazing land have found that the cost varies from $1.25 to $1.50 per head. The income under range conditions varies according to the locality and the skill and intelligence of the sheep owner. In localities where the wool is comparatively free from sand, the income from the fleece is from $1 to $1.50 per sheep. The lambs may be sold in the fall at $5 to $6 a head, depending upon their condition; and by feeding for a short time additional profit may be obtained. Some of the best sheep managers make a profit of $2 per head, but such high returns are above the average and cannot be realized every year.

Although sheep are well adapted to scanty vegetation and are capable of giving good returns on the semiarid lands, they also respond to liberal feeding and can be made to return good profits under farming conditions. The high-priced agricultural lands of Great Britain maintain an average of 680 sheep per thousand acres; those of Scotland as high as 1380 sheep per thousand acres of agricultural land. In the farming States, where mutton is the primary consideration and wool incidental, sheep raising will usually return a satisfactory profit independent of the price of wool, as it has been demonstrated that the cost of producing a pound of mutton from good mutton sheep does not exceed that of producing a pound of beef. Practical feeders have found that surplus grain may be fed with profit, and the number of sheep in the grain-producing States seems to be increasing. Corn (see MAIZE) is one of the cheapest grain rations for lambs. It is often fed in a mixture with oats or peas, and, for fattening, a little oil cake added. Various green crops, especially rape (q.v.), are grown for sheep pasture, the sheep being hurdled upon the fields and a rotation of green crops provided. Roots are extensively used, especially in England and parts of the United States where corn cannot be grown. Corn silage is equal in feeding value to roots and is much cheaper. A ration composed of shelled corn, clover hay, and corn silage has generally been found to be the most economical for fattening purposes. See SILAGE.

Hothouse lambs are those that are dropped out of the regular season and fed to meet a special market, the fancy Christmas, and winter trade. Not all ewes can be made to lamb in the fall, the Dorset and Tunis breeds being best adapted for this purpose.

The sheep in the principal countries of the world are, approximately, as follows: United

States, 49,000,000; Argentina, 80,000,000; Uruguay, 26,000,000; Austria-Hungary, 16,000,000; France, 16,000,000; Italy, 11,000,000; Russia in Europe, 46,000,000; Spain, 16,000,000; Turkey in Europe, 21,000,000; England, 17,000,000; Russia in Asia, 24,000,000; Turkey in Asia, 45,000,000; South Africa, 30,000,000.

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SHEEP BOT. See BOT, BOTFLY.

SHEEP DOG, or COLLIE. Any of several kinds of dogs used to guard and control flocks of sheep or cattle. The sheep dog, which Buffon regarded as the most ancient breed of domestic dog, has existed in substantially its present large, hardy, long-haired form, characterized by a high degree of intelligence, since prehistoric times, and Buffon's claim may very well be true. The English-speaking world at the present is mainly interested in six varieties of sheep dogs.

The Scotch Collies. The *rough-haired variety* of the Scotch collies is the traditional and typical sheep dog of the world. He stands from 22 to 24 inches high at the shoulder, has a skull quite flat, with a fine tapering muzzle, and brains that often act with better judgment than do those of his human master on the matters within the dog's range. The sheep become perfectly acquainted with their dog and evidently regard it as a friend. It knows the sheep of the flock it is required to attend, and even in a crowded market adroitly separates them from others. Its remembrance of places is obviously very accurate.

The standard qualities called for are a heavy coat, except on the head and legs, the outer coat harsh to the touch, the undercoat soft, furry, and so close that it is difficult on parting it to see the skin; mane and frill round the neck very abundant; forelegs slightly feathered; hind legs below the hocks smooth, with a profusion of hair on the tail and long and bushy on the hips. Color ranges from black and tan to tan and white or all white; and the dog's weight varies from 45 to 65 pounds; females from 40 to 50 pounds. The ears are small and in repose are folded, but when alert thrown up and drawn together on the top of the skull. There being no brow on this breed, the eyes are necessarily placed obliquely. The general expression of the collie is that of great beauty in outline and pose, strength, activity, and attention. See Plate of HUNTING AND WATCH DOGS with article DOG.

The *smooth-coated collie* has the general character of his more popular brother, with a dense, short, flat coat of good texture, with an abundance of overcoat, but not a particle of feathering on legs, tail, or ears. He varies in color and in its distribution more than the long-coated one. Before the days of the railroad he was essentially the cattle drover's dog.

The Welsh Bobtail Collie. This variety, long known in Wales, but rarely seen elsewhere, is the largest of the collies, being 25 inches high at the shoulder. It has a shaggy, blue-gray coat and a tail inclined to be short and invariably cropped in infancy.

The Old English Sheep Dog. This race is akin to the Welsh collie in build and coat and is bobtail. It is thickset, has a shaggy iron-gray, white-marked coat, with a waterproof underfur, and its ears are carried flat on the side of the head.

The Pomeranian Sheep Dog. Though elsewhere bred as a house pet, small and useless, in its own home on the shores of the Baltic this dog is the local sheep tender. He has a foxlike face and very long hair. In color he ranges over a wide scale, but black or white is most common, and the average weight is about eight pounds. It is better known as the Spitz dog.

The Schipperke (*schipper-kee*). This is to all intents and purposes a short-coated, bobtail Pomeranian, commonly kept by the boatmen of Holland and the Rhine as a guard dog, and it is unapproachable in that capacity. The English and American standard for these dogs calls for a black coat, but in Holland fawns and whites are very popular. Two sizes are recognized, one from 9 to 12 pounds in weight, and another from 12 to 20 pounds.

Consult authorities cited under DOG.

SHEEPKILL. See KALMIA.

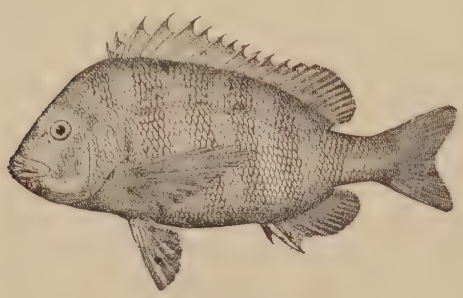
SHEEP LAUREL. See KALMIA.

SHEEP LOUSE, or SHEEP TICK, or (in Scotland) KAID. A reddish-brown fly (*Melophagus ovinus*) of the family Hippoboscidæ. It lives in the wool of sheep, and particularly of lambs, sucking the blood of the animal, and is most abundant in the early part of summer. It is wingless and somewhat resembles a tick, and where it fixes its head in the skin a large tumor is formed. The female hatches eggs and nourishes the five to eight larvæ within her own body until just before they pass into the pupa state, when they are deposited, oval-shaped and

shining, and fastened to the wool of the sheep. Farmers use various washes or dips for the destruction of this pest, also pyrethrum powder.

SHEEP'SHANK'. See KNOTTING AND SPLICING.

SHEEPS'HEAD'. An American food fish (*Archosargus probatocephalus*) of the porgy family (Sparidæ), considered one of the finest for the table found along the Atlantic or Gulf coast of the United States. It grows to a weight of 20 pounds, but the average is about seven pounds. It has a deep body, marked by seven or eight transverse bands, most evident



SHEEPSHEAD.

in the young. The mouth has prominent incisor teeth which help to give the head a fancied resemblance to that of a sheep. It is a bottom feeder and lives on shellfish and small crustaceans, especially barnacles, and also on seaweed. The spawning period is from March to June.

The same name is given in the West to the fresh-water drum (*Aplodinotus grunniens*), a large sciænid fish which in Texas and Louisiana is well liked, but in the North is not eaten. It reaches a weight of 50 to 60 pounds and is silvery gray or dusky with obscure oblique streaks on the sides. It is also called gaspergou croaker, and white perch. Consult G. B. Goode, *Fishery Industries* (Washington, 1884). See FISHERIES.

SHEEP'S-WOOL. See SPONGE.

SHEEP TICK. See FOREST FLY; SHEEP LOUSE; TICK.

SHEERNESS'. A seaport and naval arsenal in Kent, England, in the northwestern part of the Isle of Sheppey, at the confluence of the Thames and Medway, 11 miles east-northeast of Chatham (Map: England, G 5). It consists of four divisions: Blue-Town, Mile-Town, Marine-Town, and Westminster. The dockyard was founded by Charles II. It covers 60 acres, comprising wet and dry docks, storehouses, official residences, and naval barracks. There are a coast-guard station and military barracks. Grain, seeds, and oysters are exported. Sheerness was captured by the Dutch under De Ruyter in 1667, and here the mutiny of the Nore originated in 1798. Pop., 1901, 18,300; 1911, 17,487.

SHEET BEND. See KNOTTING AND SPLICING.

SHEF'FIELD. A manufacturing city in the West Riding of Yorkshire, England, situated on several hills that slope towards the confluence of the rivers Sheaf and Don, 165 miles north-northwest of London and 41 miles east of Manchester (Map: England, E 3). It possesses many fine public buildings, such as the parish church, erected in the reign of Henry I, 240 feet long by 130 feet broad; St. Mary's Catholic Church, surmounted by a tower 200 feet high; the town hall, erected 1891; cutlers' hall; corn exchange; the market hall, or Norfolk market; etc. There are extensive botanic gardens, a fine cemetery about a mile from the town, St. George's Museum (founded by Ruskin), the Mappin Art Gallery, and a mechanics' institution, established in 1832. The mechanics' library (1828) is now merged into the free library, and there is also the Sheffield Library. Sheffield is a notable educational centre, possessing a university, founded in 1905 and attended by 1800 students, as well as numerous secondary, technical, and art schools.

The Albert Hall, erected in 1873, is a commodious building which seats 3000 people. The municipality was the first in England to operate its tramways; it also owns its electric-lighting and power plant and markets, provides artisans' dwellings, baths, free libraries, and a series of excellent parks, and supports technical education. As far back as the time of Chaucer, Sheffield was noted for the manufacture of cutlery; an endless variety of articles of every description is produced. Knives, silver and plated articles, white-metal goods, coach springs, spades, spindles, hammers, files, saws, boilers, stoves, grates, buttons, and bicycles are among the leading articles. After 1871 the introduction of the manufacture of armor plates, railway springs, tires, and rails gave a remarkable impetus to the growth of the town. Although a very ancient town, its history is uneventful. It received a charter from Edward I. Mary, Queen of Scots, spent 12 years of her captivity in the castle. During the Civil War the town was seized by the Parliamentarians, abandoned to the Earl of Newcastle, recaptured, and the castle demolished in 1644. In 1893 Sheffield was constituted a city, and its mayor received the title of Lord Mayor in 1897. Five members are returned to Parliament. Pop., 1901, 380,700; 1911, 454,632. Consult Gatty, *Sheffield, Past and Present* (London, 1873).

SHEFFIELD. A city in Colbert Co., Ala., 1 mile north of Tuscumbia, on the Tennessee River and on the Louisville and Nashville, the Northern Alabama, and the Southern railroads (Map: Alabama, B 1). Iron products and lumber are manufactured, and there are coal and iron mining and farming interests. Pop., 1900, 3333; 1910, 4865.

SHEFFIELD, JOHN, DUKE OF BUCKINGHAM AND NORMANBY (1649–1721). See BUCKINGHAM AND NORMANBY.

SHEFFIELD, JOSEPH EARLE (1793–1882). An American merchant, born at Southport, Conn. At the age of 15 he entered commercial life at Newbern, N. C., and afterward removed to Mobile, Ala., where he amassed great wealth and became one of the largest cotton shippers in the country. He returned to Connecticut in 1835 and became largely interested in the promotion and construction of new railroads. For many years he was president of the New Haven and Northampton Railroad, and he was one of the organizers of the New York, New Haven, and Hartford, and of the Chicago and Rock Island. Through his efforts and by means of his munificence the scientific department of Yale was reorganized and established on its own foundation as a separate school of the university under the name of the Sheffield Scientific School.

SHEFFIELD PLATE. See PLATE.

SHEFFIELD SCIENTIFIC SCHOOL. See YALE UNIVERSITY.

SHE (or **SHIH**) **HWANG-TI,** shē'hwäng'tē' (259–210 B.C.). The name by which Prince Ching (or Cheng), the putative son of Chwang Siang Wang, ruler of the feudal State of Tsin, is known in Chinese history. In 246 B.C., when only 13 he succeeded to the throne of Tsin, then all but paramount, and remained for several years under the tutelage of a wily adventurer named Lü Puh-wei, regarded by Chinese critics and historians as his father. Under his advice the subjugation of the feudal princes, who still remained faithful to the house of Chow, was continued with vigor, and succeeded so well that in 221 B.C., the twenty-sixth year of his reign, the ruler declared himself the sole master of China, assuming the title She Hwang-ti, or First Emperor, with whom everything should begin and from whom everything should date. The feudal system was abolished, the whole country as it existed then was divided into 36 provinces, and Hien-yang, near the present Singanfu, in Shensi, became his capital. He ordained, under penalty of branding and four years' service on the Great Wall, that all books except those on agriculture, medicine, and divination should be delivered up to be burned. Four hundred and sixty scholars, who protested, were buried alive. The Emperor constructed roads and canals, erected many fine buildings, and, to protect the country from the inroads of the Huns and other barbarians, he constructed the Chinese Wall (q.v.). Consult Friedrich Hirth, *Ancient History of China* (New York, 1911).

SHEIK, or **SHEIKH,** shēk *or* shāk (Ar. *shaikh,* old man). A title of respect among Mohammedans. It is applied to the chief of a Bedouin tribe, the head man of a village (*Sheikh al balad*), or one of the higher order of religious preachers; also, in general, to men 50 years of age or older. The Sheikh al Islam is the Grand Mufti or head of the Mohammedan church in the Turkish Empire. See MUFTI.

SHEIL, shēl, RICHARD LALOR (1791–1851). An Irish orator and dramatist. He was born near Waterford, graduated at Trinity College, Dublin, studied law, and was called to the bar in 1814. In 1822 was printed the first of his *Sketches of the Irish Bar,* a keen and witty picture of the life and manners of the time. The next year he joined the Catholic Association and in 1825 was sent to oppose its suppression as joint advocate with Daniel O'Connell before Parliament. He soon became known as a political agitator and brilliant orator, was elected to Parliament in 1829, aided O'Connell in the Repeal agitation, but, changing his position, took office under the Melbourne ministry and in 1850 was sent to the Tuscan court as British Ambassador. He died at Florence. He wrote several tragedies, of which the most successful were *The Apostate* (produced at Covent Garden in 1817) and *Evadne* (1819). Consult McCullagh, *Memoirs of Richard Lalor Sheil* (London, 1855).

SHEK'EL (Heb. *sheqel,* from Assyr. *shāqal,* to weigh). An ancient weight and monetary unit. According to the system employed by the Babylonians 60 shekels were equal to one mina, and 60 minas to one talent. The weight of the shekel in the common standard was about 126 grains or, according to a system in which double weights were used, 252 grains, and according to the royal standard 130 or 260 grains. For weighing precious metals a talent of 3000 and a mina of 50 shekels were employed; for silver, to adjust the ratio to gold, the shekel was taken as 168 or 336 grains. In Phœnicia a silver shekel of about 112 (or 224) grains was employed. Among the Hebrews the 3000-shekel talent and 50-shekel mina were used. (Cf. Ex. xxxviii. 25–26.) The shekel was subdivided as follows: a half shekel was called a *beḳá,* a twentieth part of a shekel a *gērāh.* The Hebrew gold shekel had the same weight as the common Babylonian shekel; the silver shekel was the same as the Phœnician silver shekel. The intrinsic value of the Hebrew (heavy) gold shekel was somewhere near $10, and of the silver shekel somewhat less than 75 cents. The Jews did not actually coin money before the time of Simon the Hasmonæan (died 135 B.C.), to whom Antiochus VII Sidetes gave the power of so doing (1 Macc. xv. 6). It has been held by some numismatists that the silver shekels and half shekels bearing the inscriptions "Jerusalem the Holy," "Shekel of Israel" (or "Half shekel of Israel"), and "Year one, two, three, four, or five," were coined at the time of the revolt against Rome (66–70 A.D.). But others, with more probability, maintain that they were issued by Simon, beginning with the year 139/8, when permission was given. Consult: Madden, *Coins of the Jews* (London, 1881); Kennedy, "Money," in Hastings, *Bible Dictionary,* vol. iii (New York, 1900); Th. Reinach, "Numismatics," in *The Jewish Encyclopedia* (ib., 1905); Benzinger, *Hebräische Archäologie* (2d ed., Tübingen, 1907).

SHEKINAH, shē-kī'nȧ (Late Heb. *shĕkīnāh,* from *shākan,* to reside or dwell). A term that belongs to Jewish theology of the period after the close of the Hebrew canon and was adopted by early Christian writers, expressing the presence of the divine majesty in heaven, among the people of Israel, or in the sanctuary. The origin both of the term and of the idea is due to the tendency of postexilic Judaism to avoid conceptions of God that seemed to attribute to Him human qualities or to apply limitations of any kind to His being. This led naturally to a view which removed the Deity from any direct contact with this world and which kept Him, as it were, aloof—separated from mankind by a wide chasm, which, however, was in a measure bridged over by intermediary hypostases, such as the "wisdom" in the Book of Wisdom and the Philonian Logos or Word of God, as something distinct from God Himself. The Shekinah belongs to the same class of ideas. In its most specific sense the Shekinah idea is derived from descriptions of Yahwe in the Old Testament, such as those which represent Him as manifesting His presence by the descent of a cloud over the tabernacle. (Ex. xl. 34.) Similarly a cloud rests on Mount Sinai for six days, and it was from the cloud that Yahwe on the seventh day called to Moses to ascend. (Ex. xxiv. 12.) The term used to describe this Divine presence is *shākan,* "to rest" ("the glory of Yahwe rested on Mount Sinai"), from which Shekinah is a direct derivative. Hence Shekinah became the term expressive of the Divine presence, and in the Jewish Targums (q.v.), where the term is first encountered, Shekinah is used as the equivalent of the Divine Being and served as a means of disguising such anthropomorphic expressions as Yahwe "dwelling be-

tween the cherubim" (1 Sam. iv. 4, etc.) or Yahwe dwelling in a certain place. In all such passages the Targum introduces the term Shekinah. None of them is certain to be older than the second century A.D. It was a natural process that led to the personification of the Shekinah, as something distinct from God Himself, and this meaning is implied in the Talmudical view which makes Shekinah the source of inspiration, a kind of spirit sent out by God and carrying out His orders. As an active force the province of the Shekinah extends to Sheol, and when the wicked ascend out of Sheol, the Shekinah is pictured as marching at their head. The Shekinah accompanies Israel to Babylon and indeed, according to the current view, is inseparable from God's people, although, in contradiction to this idea, it is maintained that the Shekinah was not visible in the second temple, while others maintain that after the destruction of the temple by Titus the Shekinah rested behind the remaining western wall. Such contradictions illustrate at once the vagueness and variety of the conception regarding the Shekinah itself. In the New Testament and the later apocryphal literature we find the Shekinah idea frequently introduced, the Greek word employed for it being δόξα, *doxa*, literally "glory." The term is used for God Himself, while phrases like "glory of the father" (e.g., Rom. vi. 4) and the "spirit of glory" (1 Pet. iv. 14) point likewise to the familiarity of the readers with the term and conception of the Shekinah. In the emphasis upon those on whom the Shekinah rested there is here and there in Talmudic literature unmistakable polemics against Christianity. The conception lent itself likewise to mystical interpretations, and hence in the Cabbala the Shekinah, still more completely personified than in rabbinical and early Christian writings, plays an important rôle. Consult: Langen, *Judenthum in Palästina zur Zeit Christi* (Freiburg, 1866); Weber, *Jüdische Theologie* (Leipzig, 1897); Bousset, *Die Religion des Judentums im neutestamentlichen Zeitalter* (Berlin, 1903); Ludwig Blau, in *The Jewish Encyclopedia* (New York, 1905).

SHEL'BURNE, William Petty Fitzmaurice, Earl of (1737–1805). An English statesman. He was born in Dublin and educated at Christ Church, Oxford (1753), but left without a degree, desiring a military life. He intended to enter the Commons in 1761, but his father's death that year transferred him to the House of Lords. He entered George Grenville's administration in 1763, at the head of the Board of Trade, and at once became a member of the Opposition and a devoted follower of the elder Pitt. In Chatham's second ministry (1766) Shelburne became Secretary of State for the Southern Department, but, opposed to the measures of the cabinet in regard to the American Colonies—the Stamp Act, the Regulating Act, and the later coercive measures—hated by the King, denounced by his colleagues, he resigned (1768) and became a bitter opponent of the King's and Lord North's policy. He favored conciliation, was for withdrawing the troops from America, and wished the Colonies to be free rather than retained by force. Upon the fall of Lord North's ministry in 1782, George III sent for Shelburne and proposed that he should form a government. He declined, but consented to serve in the Rockingham ministry as Secretary of State on condition that the King recognize the United States. Upon the death of Rockingham in the same year Shelburne became Prime Minister, but his ministry, on the occasion of the King's announcement of his determination to concede the independence of the American Colonies, found itself outvoted by the coalition between Fox and Lord North. Shelburne resigned and never held office afterward. He was created Marquis of Lansdowne in 1784, and he subsequently indulged his tastes in the adornment of Lansdowne House by collecting a splendid gallery of pictures and a valuable library. Consult Lord Fitzmaurice, *Life of William, Earl of Shelburne* (2 vols., London, 1875–76; rev. ed., 1912).

SHEL'BY, Isaac (1750–1826). An American soldier, first Governor of Kentucky, born near Hagerstown, Md. At 20 he was elected deputy sheriff of Frederick Co., Md., but in 1771 removed to the site of the present Bristol, Tenn., and in 1774 served as lieutenant at the battle of Point Pleasant. In 1776, during the Revolution, he became a captain of a Virginia force, in 1780 was colonel in the North Carolina militia, and won distinction at the battle of King's Mountain. He served in the Southern campaign under General Greene. Settling in the Kentucky region in 1783, he was instrumental in effecting its separation from Virginia, sat in the State Constitutional Convention, and was the first Governor (1792–96), serving a second term from 1812 to 1816. With 4000 Kentucky volunteers he joined General Harrison early in 1812 and rendered great service at the battle of the Thames (q.v.).

SHEL'BYVILLE. A city and the county seat of Shelby Co., Ill., 50 miles southeast of Springfield, on the Chicago and Eastern Illinois and the Cleveland, Cincinnati, Chicago, and St. Louis railroads (Map: Illinois, G 7). It has manufactories of wooden novelties, gasoline engines, etc. The city has a Carnegie library. Pop., 1900, 3546; 1910, 3590.

SHELBYVILLE. A city and the county seat of Shelby Co., Ind., 26 miles southeast of Indianapolis, on the Blue River and on the Cleveland, Cincinnati, Chicago, and St. Louis and the Pittsburgh, Cincinnati, Chicago, and St. Louis railroads (Map: Indiana, F 6). The high-school building, the courthouse, city hall, City Hospital, Hord Sanitarium, and the Carnegie Library are noteworthy. Forest Hill Cemetery and the bridges across Blue River are other features. The city has extensive manufacturing interests, there being 16 furniture factories. Other products are flour, brick, carriages, glue, soda founts, baking powder, mirrors, novelties, and lumber. Pop., 1900, 7161; 1910, 9500; 1915 (U. S. est.), 10,729.

SHELBYVILLE. A city and the county seat of Shelby Co., Ky., 30 miles east of Louisville, on the Southern, the Louisville and Nashville, the Chesapeake and Ohio, and the Louisville and Interurban railroads (Map: Kentucky, E 3). It has Science Hill School for girls, a Carnegie library, and a fine courthouse. This city is the centre of a large tobacco trade and of important cattle-raising and horse-breeding interests. There are tobacco warehouses, grain elevators, and manufactories of flour and lumber products. Pop., 1900, 3016; 1910, 3412.

SHEL'DON. A city in O'Brien Co., Iowa, 58 miles north-northeast of Sioux City, on the Chicago, Milwaukee, and St. Paul, the Illinois Central, and the Chicago and Northwestern

railroads (Map: Iowa, B 1). It has two hospitals and a public library. There are flour mills, creameries, grain elevators, machine shops, cement-block and tile works, and cigar and fixture factories. Pop., 1900, 2282; 1910, 2941.

SHELDON, CHARLES MONROE (1857–). An American clergyman, born at Wellsville, N. Y. He graduated at Brown University in 1883 and at the Andover Theological Seminary three years later. From 1889 to 1912 he was pastor of the Central Congregational Church at Topeka, Kans., and thenceforth was minister at large for his denomination. In 1900 he conducted a Topeka daily newspaper for one week in accordance with what he believed a Christian policy. The undertaking gained wide publicity. Besides editing several books he published: *Robert Hardy's Seven Days* (1892); *The Crucifixion of Philip Strong* (1893); *His Brother's Keeper* (1895); *In His Steps* (1896), for which he is best known; *The Redemption of Freetown* (1898); *Who Killed Joe's Baby?* (1901); *The Heart of the World* (1905); *A Sheldon Year Book* (1909); *Jesus is Here* (1914).

SHELDON, EDWARD (1886–). An American playwright, born in Chicago. He graduated from Harvard in 1907, and his first play, *Salvation Nell,* was produced the following year while he was still there, working for the A.M. degree in Prof. George Pierce Baker's noted course on the drama. Mrs. Fiske starred in *Salvation Nell.* Sheldon's best-known plays are *The Nigger* (1909), produced at the New Theatre, New York; *The Boss* (1911); *The High Road* (1912); *Romance* (1913); *The Song of Songs* (1914), a dramatization of Sudermann's novel of the same name.

SHELDON, EDWARD STEVENS (1851–). An American philologist, born at Waterville, Me. In 1872 he graduated from Harvard, where (after studying at Berlin, Paris, and Leipzig) he was instructor in modern languages in 1877–84, assistant professor of Romance philology in 1884–94, and thenceforth professor. He served as president of the Modern Language Association of America in 1901, of the American Dialect Society in 1904–05, and of the Dante Society of Cambridge, Mass., after 1909. Professor Sheldon published *A Short German Grammar* (1879; 2d ed., 1880) and *Concordanza delle opere italiane in prosa e del canzoniere di Dante Alighieri* (1905), with A. C. White.

SHELDON, HENRY CLAY (1845–). An American Methodist Episcopal theologian, born at Martinsburg, N. Y. He graduated from Yale (1867) and (1871) Boston University School of Theology, where from 1875 to 1895 he was professor of historic theology. In the latter year he was transferred to the chair of systematic theology. He was a member of the Ecumenical Methodist Conference of 1911. His writings include *History of Christian Doctrine* (2 vols., 1886; 4th ed., 1906), which has been translated into Japanese; *History of the Christian Church* (5 vols., 1894); *A System of Christian Doctrine* (1903); *A History of Unbelief in the Nineteenth Century* (1907); *Sacerdotalism in the Nineteenth Century* (1909); *New Testament Theology* (rev. ed., 1911); *Rudolf Eucken's Message to our Age; Christian Science So-Called* (1913); *A Fourfold Test of Mormonism* (1914); *Studies in Recent Adventism* (1915).

SHELDON, SAMUEL (1862–). An American electrical engineer, born at Middlebury, Vt. He graduated from Middlebury College in 1883 and from the University of Würzburg (Ph.D.) in 1888. In 1888–89 he was an assistant in physics at Harvard and thenceforth served as professor of physics and electrical engineering in the Brooklyn Polytechnic Institute. He became, also, president of the department of electricity of the Brooklyn Institute of Arts and Sciences. From 1903 he was an expert of the Swiss Department of Justice and Police. He served as president of the American Institute of Electrical Engineers in 1906–07. Sheldon is author of *Dynamo Electric Machinery* (1900; 9th ed., 1915) and joint author of *Alternating Current Machines* (1902; 9th ed., 1911) and *Electric Traction and Transmission Engineering* (1911).

SHEL'DRAKE, or **SHIEL'DRAKE** (from *shield* + *drake;* so called in allusion to the coloration of its plumage). A large and handsome gooselike duck (*Tadorna cornuta*), known throughout all Europe and Asia, representing a genus containing many East Indian and Australasian species related to the tree ducks. It nests in rabbit burrows or holes in soft soil, whence in some places the sheldrake receives the name of burrow duck. The sheldrake is capable of being tamed and breeds in domestication. Its note is a shrill whistle. Its flesh is coarse and unpalatable, but the eggs are usable. In America the name is sometimes given to the merganser (q.v.). Consult Alfred Newton, *Dictionary of Birds* (London, 1893–96).

SHELIFF, shĕl'if *or* shĕ-lēf' (ancient *Chinalaph*). The chief river of Algeria (q.v.). It rises in the Shotts and after a course of 400 miles flows into the Mediterranean near Mostaganem.

SHELL. In its modern sense, a projectile used by field artillery, consisting of a steel case filled with a bursting charge of high explosive, usually intended to explode upon percussion. Shell with time fuses is sometimes employed in the attack on troops sheltered in intrenchments, the theory being that when the shell is exploded the fragments scatter in all directions except to the rear, while the cone of dispersion of shrapnel balls rarely exceeds 20 degrees. Percussion shell is particularly adapted to the attack on buildings, walls, masonry, and artillery carriages. When fired by light field guns its effect against earthworks, unless the ground be frozen, is very slight. In the Great War resort was had to high explosive shell to blast away the trenches before an attack could be made. See PROJECTILES.

SHELL, IN HERALDRY. See ESCALOP.

SHEL'LABAR'GER, SAMUEL (1817–96). An American Congressman, born in Clark Co., Ohio. He graduated at Miami University in 1842 and was elected to the Legislature in 1851. In 1861 he became a Republican member of the National House of Representatives, and he was returned to the Thirty-ninth, Fortieth, and Forty-second Congresses. He was especially active in the Reconstruction debates and made a remarkable reply to Raymond, who had upheld the Reconstruction policy of President Johnson. Later Shellabarger introduced that section of the Reconstruction Act of March 2, 1867, which provided that the States recently in rebellion should, until restored by Congress to their normal relations with the Union, be governed provisionally under the paramount authority of the United States, and that no person should be deprived of the right to vote

because of color. In 1871 he reported to the House and managed on the floor the bill which, in an amended form, was finally passed as the famous Ku-Klux Act. In 1869–70 he served as Minister to Portugal and was a member of the Civil Service Commission in 1874–75.

SHELLAC. See LAC.

SHELLBARK. See HICKORY.

SHEL'LER, ALEXANDER KONSTANTINOVITCH (1838–1900). A Russian novelist who wrote under the pseudonym of Mikhailov. His first work to attract general attention was his novel *Putrid Marshes* (1864), dealing with the social stagnation in Russia at the time. This was followed by *The Life of Shupov* (1865) and many other works of fiction, of which *Bread and Fun, The Sins of Others,* and *When Wood is Chopped Chips'll Fly* are perhaps the most successful. Through all his novels, which are not highly artistic, runs a reformative purpose, reflecting the author's deep interest in the social, religious, and educational problems which agitated all leaders of Russian progress in those days of transition.

SHEL'LEY, HARRY ROWE (1858–). An American composer, born at New Haven, Conn. He studied with Gustav J. Stoeckel at Yale College, with Dudley Buck, Vogrich, and Dvořák in New York, and subsequently completed his musical education in London and Paris. In 1899 he became organist of the Fifth Avenue Baptist Church, New York. He was admitted to the National Institute of Arts and Letters. Among his works are: two symphonies; a symphonic poem, *The Crusaders;* a suite for orchestra, *Souvenir de Baden-Baden;* a sacred cantata, *The Inheritance Divine;* a violin concerto; an opera *Leila* (manuscript); songs and organ pieces.

SHELLEY, MARY WOLLSTONECRAFT (1797–1851). An English author, the second wife of Percy Bysshe Shelley (q.v.), born in London. She was the daughter of William Godwin and Mary Wollstonecraft Godwin (qq.v.). Her education, under a stepmother's direction, seems to have been that of the average girl of her day and class, save for the intellectual stimulus of the distinguished visitors to her father's house, which must have meant much to one of her alert and active mind. In 1814 she left England with the poet Shelley, whose acquaintance she had made a few months earlier—an acquaintance which soon became a mutual passion. At this time Shelley's troubles with his wife, Harriet, were harassing him, and it was not until 1816 that her tragic death put an end to the complexity of the situation. A fortnight after the news of Harriet's death reached Shelley he married Mary Godwin. The marriage proved on the whole happy, though, at least while her poet husband lived, Mary Shelley had not the insight fully to discern the quality of his greatness, and Shelley found that his wife possessed a quick temper. Of Mary Shelley's writings may be mentioned first the invaluable notes to the four-volume edition of Shelley which appeared in 1839. But for years her pen had been variously busy with romances, journalistic work, and miscellaneous hack work pursued relentlessly, and to the detriment of her health, in order to give her son an education at Harrow and at Cambridge. It was not until 1840, when her father-in-law, Sir Timothy Shelley, settled £400 a year on her son, that the financial pressure was eased for her—a pressure which ceased entirely when, in 1844, Sir Timothy died, and young Percy came to his own. Of her romances *The Last Man* (1826) and *Lodore* (1835) are especially interesting because the Adrian of the former book is a portrait of Shelley and because the latter is in large measure, as Professor Dowden was the first to discover and explain, a veiled autobiography in which its author and Shelley and those who played a part in the events of their early years together appear. Her *Frankenstein* (1818) is an effective romance of terror. In addition should be mentioned *Rambles in Germany and Italy* (2 vols., 1844). Consult the biography by Mrs. Julian Marshall (London, 1889).

SHELLEY, PERCY BYSSHE (1792–1822). An English revolutionary and lyric poet of the highest rank. Shelley was of old English stock. His grandfather, Bysshe, who was born in America and on his removal to England as heir to a small landed estate enriched the family by wealthy marriages, was made Baronet in 1806. Shelley, the eldest child of Timothy and Elizabeth (Pilford), was the hope of this new establishment. He was born at Field Place, Warnham, near Horsham, England, on Aug. 4, 1792. He studied first under the Rev. Thomas Edwards, of Horsham, then in a middle-class school known as Sion House Academy, near Brantford, also kept by a clergyman named Dr. Greenlaw. At this school the sensitive boy was persecuted by his fellows to such an extent that he developed a fierce hatred of oppression. At the same time he began to love science ardently, although his temperament was romantic rather than scientific. At the age of 13 he went to Eton, where he again showed his hatred of tyranny. In October, 1810, he went to University College, Oxford, where his father had been before him. The boy displayed literary precocity, and his family indulged him in a taste for early publication; at Eton he had published *Zastrozzi,* a wild romance, and at Oxford he wrote a second tale, *St. Irvyne,* and various ventures in verse. After a scant six months' residence he was expelled from the university on account of a tract, *The Necessity of Atheism* (1811), which he had published and circulated. Though he was only a youth of 18, English radicalism of the stripe of Godwin's had declared itself in him in many ways, and before his faculty for verse had ripened or manifested itself with any distinctness his mind was given to materialistic and individualistic ideas, projects of social and political reform, and to their advocacy in prose tracts. He carried his independence into his actions. At this youthful time his conduct was undisciplined by judgment, and his mind was unsettled in intellectual principles. He was by nature impulsive and by habit uncontrollable; his ardency showed itself by quick execution as well as by emotionalism. His home was never a comfortable abiding place for him, and disagreement with his family, stolid and conventional people, was an increasing factor until it brought about complete alienation. His expulsion from Oxford was followed the next summer by a romantic marriage, one rather of pity than of love, with the 16-year-old daughter of a retired London tavern keeper, Harriet Westbrook, with whom he had become acquainted through his sister. They eloped and were married in Edinburgh and thereafter lived a wandering and

debt-harassed life in different parts of England and in Ireland, whither Shelley went in 1812 with a view to political agitation of which his *Address to the Irish People*, *Proposals for an Association*, and his public speech at Dublin on O'Connell's platform are memorials. He became a subject of government surveillance as a dangerous character. His position was improved by the financial arrangements made when he came of age in 1813, but his domestic life had become troubled, and coldness had come to exist between husband and wife. In July, 1814, he eloped with Mary Godwin, putting in practice the principles he held and dealing openly with Harriet, for whom he made provision; but misfortune followed, and in 1816 Harriet committed suicide by drowning, and a few months later their two children were denied to Shelley's custody by the famous decision of Lord Eldon, on the ground that Shelley was an atheist. About a fortnight after the news of Harriet's death reached him he married Mary Godwin. Shelley soon after left England and spent the remainder of his brief life in Italy, going from city to city, finally settling in the neighborhood of Pisa. On July 8, 1822, he sailed from Leghorn to Spezia, where he had settled for the summer. A squall overwhelmed the little craft in which Shelley was, and he was drowned. The body, which was thrown up on the shore at Viareggio, was burned, and the ashes, except the heart, which was unconsumed, were buried in the Protestant cemetery at Rome. He had several children, of whom only one survived him, Percy, who inherited the title on his grandfather's death.

Shelley's works contain two easily distinguished strains: one, the propagandism of opinion which is associated with his "passion for reforming the world"; the other, the expression of his personality, his essential being, in the creation of lyrical beauty by spontaneous and half-unconscious art. He adopted from early youth radical formulas of Anglicized French thought, certain beliefs regarding the perfectibility of man, the evil of social institutions like property and marriage, and the inviolability of the individual. He had an active philosophical mind and an active philanthropic spirit; to these two, and to the necessity for expression inherent in his powerful genius, his first works were chiefly indebted. Three times he did, in effect, utter his whole mind. In *Queen Mab* (c.1813), his first important poem and the one by which he was long the most widely known, he put forth all he had learned and thought. In it are amalgamated his first essays in verse and prose to make a whole view of the world and of society. In *The Revolt of Islam* (1817–18), a more imaginative and elaborate poem, setting forth the moral revolution of the world under the form of a romantic epic, he did the same thing again. In *Prometheus Unbound* (1820), though in forms of much higher poetry, he achieved the task still a third time. To say that in the social part of these great works he put Godwin's philosophy into verse is a very imperfect description. The principles of Godwin were no more than the chrysalis that released the butterfly; the poet transformed the philosophy of his teacher, and it came forth as poetry with a different potency and meaning. Yet the intellectual units of his thought were to be found in English radicalism. Shelley, however, never stiffened into any formula, but constantly and increasingly responded to fresh knowledge. The most efficient new element in his earlier development was Greek. In *Queen Mab* and *The Revolt of Islam* this is not felt; in *Prometheus Unbound* it is the soul of the poem. Philosophically the study of Plato changed him from a materialistic atheist, of a Lucretian type, to a pantheist, though the term as applied to him is a crude one; and under Æschylus he became a master of choral myth, and under the impulse of Greek imagination generally, a symbolic poet. In becoming less didactic and more imaginative in style, less Latin and French and more Greek and Italian in inspiration, less definitely dogmatic and more intuitive, prophetic, and personal in method, he changed from a respectable minor poet of intellectual and descriptive power and emotional abandon to a great lyrical master of the imagination. Mystery is a constantly increasing element in his work and almost measures his growth; in thought it plunges him into depths which he describes as speechless, and in the sensuous world it fills the atmosphere of the verse with light, color, and fragrance and embodies forms of nature and idealities of character which overpower and distract his readers. This presence of mystery is most obvious in the series of works which are more personal and disengaged from any preoccupation with the present world. In *Alastor* (published 1816) it is not sufficient to cloud the narrative or the picture, but is a mood; in such poems as *The Sensitive Plant* (1820) and *The Witch of Atlas* (1820), apparently simple in fable, the evasiveness of the meaning is constant, like a retreating echo in the woods; in *Epipsychidion* (1821) the mystery has made the poem one only for elect readers. In the *Adonais* (1821), which after *Alastor* and *Queen Mab* is probably most easily read in a popular way, the mystery, though deep and pervasive, goes naturally with the theme of early death, in which both Keats and Shelley are the answering chords. So, too, on the purely intellectual side, the prose *Defense of Poetry* (1821; published in 1840) discloses to a careful reader the ground of mystery in all Shelley's later thinking. Apart from the major works of the poet stand the brief lyrics and the odes and the many fragments, which are also divided between a predominant social interest, as the *Ode to Liberty*, and a personal inspirational interest, as the *Lines to an Indian Air*. In his growth he never lost touch with the present world, of which fact *Hellas* (1822) and *The Masque of Anarchy* (1819; published in 1832) are capital examples. In his dramatic attempts, seeking objective artistic results by effort, he was off the line of his genius, and neither *The Cenci* (1819) nor *Charles I*, of which only a few scenes exist, reaches an excellence comparable to that of his other achievements. The most obvious quality of his verse, melody, is so readily felt that he is placed without any division of opinion among the great lyrical poets of England with the first. In other respects, though his fame is now established, in the minds of many he is regarded as vague in meaning, hysterical in feeling, loose and diffuse in style. He was the poet of abstract and ideal love and set forth under that conception the concrete beauty and order of the universe as he saw it and of man's life as he desired it to be.

His personal character was such as to draw

about him many devoted friends, of whom some, as Leigh Hunt, Byron, Peacock, Trelawny, and Horace Smith, are well known; and he also attracted women, who are chiefly known by the verse in which, as in life, he idealized them. The charm he exercised is best seen in their own words. In fact every one who knew him seems to have loved him. He was by nature generous and gave so liberally of his scanty means as to keep himself always poor. He was constant in friendly kindness to all associated with him, and he at all times went about doing charity among the poor. He was violent in indignation against actual wrong, but gentleness characterized him. His later years were full of sadness from one or another cause.

Bibliography. Shelley's verse and prose were edited in eight volumes by Forman (London, 1876–80); the poems by W. M. Rossetti (ib., 1870, 1878, 1888), Woodberry (Boston, 1892), Dowden (London, 1899), and Thomas Hutchinson (Clarendon Press, 1905), Hutchinson's edition containing a few poems not in other editions. Consult also notes in Mrs. Shelley's edition of *Poems* (London, 1839); Thomas Medwin, *Life* (ib., 1847); T. L. Peacock, *Memoirs* (ib., 1847); Trelawny, *Records* (ib., 1858); Lady Shelley, *Shelley Memorials* (ib., 1859); Leigh Hunt, *Autobiography* (ib., 1860); Richard Garnett, *Relics of Shelley* (ib., 1862); J. A. Symonds, *Life* (ib., 1878); J. C. Jeaffreson's hostile, but substantial, *The Real Shelley* (ib., 1885); Edward Dowden, *Life* (2 vols., ib., 1886), an indispensable and invaluable work; William Sharp, *Life* (ib., 1887); S. A. Brooke, in *Studies in Poetry* (New York, 1907); Francis Thompson, *Shelley: Essay* (ib., 1909); P. E. More, in *Shelburne Essays* (7th series, ib., 1910); A. Clutton-Brock, *Shelley the Man and the Poet* (ib., 1910); Helen Rossetti Angeli, *Shelley and his Friends in Italy* (ib., 1911); *Letters of Shelley* (ed. by Roger Ingpen, new ed., 2 vols., New York, 1915). F. S. Ellis's monumental *Lexical Concordance* (London, 1892) is useful.

SHELLEY'S CASE, Rule in. A rule of law relating to estates in real property, declared by the courts in an English case decided about 1591. The principle involved was known to the English law before that date. Briefly stated, the rule provides that where an estate of freehold is conveyed to a person for life, with a remainder to his heirs, the latter is a clause of limitation and not of purchase, i.e., the ancestor takes the estate included in the cause, and the heirs take nothing. The rule became a part of the common law and prevailed at one time in the United States, but most States have abolished or modified it by statute and give effect to the express remainder to the heirs. Consult: Kent, *Commentaries* (14th ed., 4 vols., Boston, 1896); Preston, *Essay on the Quality and Quantity of Estates* (Philadelphia, 1843); and references under Real Property.

SHELL HEAPS. See Archæology, American; Kitchen Midden.

SHELL MONEY. A primitive medium of exchange which consisted of certain sea shells in their natural condition, or nearly so, or of pieces of sea shells formed into beads or otherwise shaped. In the former class fall the money cowry (see Cowry), the dentalium, and several other shells, and in the latter the wampum of the eastern United States and currencies of the Pacific coast. On the coast of Puget Sound and northward the tusk shell (*Dentalium*) prehistorically served the purposes of money among the Indians of a large region and maintained this value and function until very recent times.

The shell money of the second class was more nearly a true coinage, since it derived its value from the art and labor which had been expended upon it and the difficulty of counterfeiting. As late as 1882, at least, the local trade of the Solomon Islands was carried on by means of flat beads, made from certain small sea shells which were ground to the proper shape by the women. As the proper grinding of these was a slow and skillful process, no more was made than was needed, and the recognized relative value was steadily maintained. Very similar to this was the wampum (q.v.), which was found in use among the tribes of the eastern half of North America at the time of its discovery by Europeans. Wampum circulated at well-understood rates of exchange throughout the interior as far as the Saskatchewan River and the Rocky Mountains. Certain coast tribes favorably situated (notably the Narraganset) made wampum as a regular occupation. The best and most was made between Cape May and Cape Cod. These beads were of two kinds—a more precious sort formed only from the violet-colored muscle scar in the interior of the quahog (*Venus mercenaria*), and a white sort, or seawan of inferior value, commonly made from the central column of one or the other of the large spiral winkles or conchs. (See Conch.) The inferiority of the latter kind lay in the greater ease with which it could be produced. The wampum, sometimes carried loose, but usually strung upon sinew threads in lengths of approximately 6 feet, was a true currency; the merchants and traders, both Dutch and English, at once adopted this native money and for many years used it in preference to European coins not only in Indian trading, but in affairs between themselves. Seeing this new use, the Indians made an increased quantity, and, worse, the white man, using machinery, began to turn out cheaply great quantities of shell beads. The result was a rapid depreciation of values, so that frequent enactments by the local governments were required to keep a fathom of wampum at par with designated numbers of pence or stivers. It finally disappeared not only because the Indians ceased to make it, but because they hoarded all they could obtain.

In California several forms of shell money circulated, each piece of a definite shape and carefully made by grinding down for one inferior kind (hawok) some clamshell, as *Saxidomus*, and for the other more valuable kind (ullo) abalone shells. A great amount of this shell money was in circulation among the aborigines of California and Oregon previous to 1850, and it long continued to be held at a high valuation, measured in gold, among the Indians.

Consult: Ingersoll, in *Country Cousins* (New York, 1884), and the many historical sources of information mentioned by him; also several papers by R. E. Stearns in the publications of the United States National Museum. For the Pacific coast, see Powers, *Contributions to North American Ethnology* (Washington, 1877).

SHELL SHOCK. See Surgery, Military.

SHELL STORK. See Openbill.

SHELTER AND HOUSING. Shelter is any natural inclosure or artificial structure used temporarily or permanently for human

habitation. As civilization has progressed and human wants have multiplied the problems connected with shelter have become so numerous that they have been gathered together and now form a separate subject of study. As one of the three chief subdivisions of home economics, shelter, which is practically synonymous with housing, has to do with the selection of sites, the making of plans, the choice of building materials, and with the problems connected with the plumbing, heating, lighting, ventilating, equipping, decorating, and furnishing of houses. While there has been a tendency to include a discussion of the social and economic factors which affect the cost of housing, the literature of the subject is still largely confined to the consideration of the percentage of a given family income which should be devoted to shelter and to the architectural, sanitary, and æsthetic aspects of housing problems.

In the budget of a family or other group living in its own house, shelter includes interest on investment, taxes, insurance, and the cost of upkeep and repairs, while in that of a family or other group living in a rented house, all these items are included in the rent. In both cases the cost of heating and lighting is usually included and sometimes the operating expenses, cleaning, and others, though the latter more often form a separate item in the budget. Statistics show that the expenditure for shelter increases with the income and bears a practically uniform ratio to it, differing in the latter respect from the percentage expenditure for food, which tends to fall as incomes grow greater. The larger actual expenditure for shelter among those of greater income may be considered to represent efforts to secure locations convenient to schools, libraries, churches, markets, and places of amusement or recreation; safety, both physical and (in the case of children particularly) moral; privacy; beauty within the house and also without; opportunities for social intercourse or for display or the satisfaction of other desires more or less legitimate according to the standard employed. Home economics reviews these desires, analyzing them in the light of the importance it attaches to home life, and seeks to establish standards of value in housing which may be used (1) by individuals or families in the selection and maintenance of dwelling places, (2) by communities in formulating building laws and regulations, and (3) by society as a whole in determining the minimum cost of forms of shelter which are adopted, from the standpoint of moral and physical well-being and efficiency, to the promotion of good citizenship.

Standards for shelter differ with climate and locality and also with time. They are affected by social and economic changes, by the extension of knowledge concerning architectural forms and decoration, and by the development of the engineering and sanitary sciences. The amount of space needed for household activities is affected by the supply of domestic labor, by increasing opportunities to buy in ready-made form articles and supplies which were formerly necessarily manufactured in the home, by the invention of labor-saving household devices, and by the passing to the community of many household functions, such as water supply and lighting. The minimum requirement of air and light per person has been determined by hygienists and embodied in building laws. Democracy, with its emphasis on the individual life, creates a demand for more space, for individual as distinguished from group activities, and the tendency is towards separate accommodations for each member of a family. Higher ideals of cleanliness place an abundant water supply and safe plumbing among the necessities and at the same time tend to modify the standards of house furnishings in the direction of simplicity. Revolt against the artificialities of city life creates a demand for space around the house, in gardens or on porches, for sleeping, eating, and general living purposes, and places value upon sites where natural beauties have been preserved. A better understanding of the ways by which communicable diseases are transmitted from one person to another makes necessary in many places costly precautions against the entrance of insects, vermin, and rodents. Travel and education bring to the attention of an increasingly large number of people good forms in architecture and decoration and by improving taste create new wants. These and many other factors tend to alter standards.

Home economics encourages research in all the sciences, physical and social, upon which an understanding of the real environmental needs of human beings must be based, and all forms of education by which reliable information is carried to the people. Courses in home economics include simple manual training for the lower schools in the arts by which textile fabrics and other house furnishings are produced, and courses of varying complexity for high schools, colleges, and universities in design, sanitation, hygiene, and the social aspects of housing.

Consult: E. H. Richards, *Cost of Shelter* (New York, 1905); Isabel Bevier, *The House* (Chicago, 1911); Talbot and Breckenridge, *The Modern Household* (Boston, 1912), containing a bibliography; Mrs. A. B. Bacon, *Beauty for Ashes* (New York, 1914); Lawrence Veiller, *Model Housing Law* (ib., 1914). See ARCHITECTURE; FOOD; FURNITURE; HEATING AND VENTILATION; HOME ECONOMICS; ILLUMINATION; MANAGEMENT, HOME AND INSTITUTION; PLUMBING; SEWAGE DISPOSAL; TEXTILES AND CLOTHING; ETC.

SHELTER BELT. See WINDBREAK.

SHEL'TIE. See PONY.

SHEL'TON. A borough in Fairfield Co., Conn., on the Housatonic River, opposite Birmingham, and on the New York, New Haven, and Hartford Railroad (Map: Connecticut, C 4). It has various manufactures. Pop., 1900, 2837; 1910, 4807.

SHELTON, DON ODELL (1867–). An American evangelist and editor, born at Odessa, Schuyler Co., N. Y. He took up courses of study with special attention to biblical and theological subjects and from 1889 to 1899 was secretary of the East Side branch of the Y. M. C. A. in New York City. He edited the *Bible Student* (1897–98), for many years was a prominent speaker at religious conventions, conducted Bible conferences in the larger American cities, and in 1906 became president of the National Bible Institute, New York. He founded and became the editor respectively of the *Bible To-Day* (1907) and the *Message* (1909) and published *Personal Work and the Personal Worker* (1896); *Higher Ideals of Christian Stewardship* (1897); *The Public Use of the Bible* (1898); *The Greatest of Books* (1900); *Daily New Testament Readings* (1901); *Christianize America* (1903); *Heroes of the Cross in America*

(1904); *Raising the Average* (1906); *Chapters on the Lord's Faithfulness* (1913).

SHELTON, THOMAS (fl. 1612). The author of the first English translation of *Don Quixote*. Shelton was intimately associated with Lord Howard of Walden, of whom he was probably a distant relative. Shortly after 1607 he translated the first part of Cervantes' famous romance from the Spanish edition issued in that year at Brussels. In 1612 the translation appeared and met with instant success. In 1620 he published his translation of the second part. Consult the reprint of his translation edited by Fitzmaurice-Kelly (in "Tudor Translations," London, 1896). This translation, although not so scholarly as some later ones, is valuable, especially because its quaint Elizabethan English gives the same flavor as the now archaic Spanish of Cervantes. Consult also A. T. Wright, *Thomas Shelton, Translator* (1898).

SHEM (Heb., name). The eldest son of Noah, brother of Japheth and Canaan according to Gen. ix. 25–27, of Ham and Japheth according to Gen. ix. 18, x. 1, and of Japheth according to x. 21, father of Elam, Asshur, Arpachshad, Lud, and Aram (Gen. x. 22). It is possible that already in Gen. ix. 20–27 Shem represents a congeries of tribes, conscious of a closer kinship, including, besides Israel, many of the tribes of Judah, the Negeb, Edom, and the East Jordan country. In Gen. x. 22 the name is more inclusive. Besides Arabs, Aramæans, Assyrians, and Arrapachæans, who are generally counted as Shemites, or Semites (q.v.), Elamites and Lydians are also included, probably because there was a tradition of an occupation of Elam by the Semitic Akkadians, and of the interior of Asia Minor, even into the realm known as Lydia, by the Assyrians. Concerning this extension of the Semites in early times information has recently been gained through the excavations at Susa and the Cappadocian tablets. (See ELAM; ASSYRIA.) In Gen. xi the pedigree of Abraham is traced back to Shem through Arpachshad (q.v.). Consult the commentaries on Genesis by Gunkel (3d ed., 1910), Skinner (1910), and Ryle (1914); Budde, *Die biblische Urgeschichte* (Giessen, 1883); Schmidt, *The Messages of the Poets* (New York, 1911).

SHEMAKHA, shĕ-mȧ-kä′. A finely situated hill town in the Government of Baku, Russian Transcaucasia, situated at an altitude of 2265 feet, 75 miles west of Baku (Map: Russia, G 6). Its many ruins testify to its ancient importance. The town manufactures silk scarfs and shawls. Pop., 1909, 23,041. Shemakha is mentioned by Ptolemy as Kamachia and was the capital of the Khanate of Shirvan. Shemakha has suffered terribly from earthquakes.

SHENANDOAH, shĕn′an-dō′ȧ. A city in Page Co., Iowa, 54 miles by rail southeast of Omaha, Neb., on the Chicago, Burlington, and Quincy, the Keokuk and Western, and the Wabash railroads (Map: Iowa, B 4). It has extensive nursery interests and large seed houses. Poultry packing is carried on, and wagons, stock powder, plows, knit goods, etc., are manufactured. Noteworthy institutions are the Elks Home, Carnegie Library, Western Normal College, and World's Missionary Training School. Pop., 1900, 3573; 1910, 4796.

SHENANDOAH. A borough in Schuylkill Co., Pa., 105 miles northwest of Philadelphia, on the Pennsylvania, the Lehigh Valley, and the Philadelphia and Reading railroads (Map: Pennsylvania, J 5). It has a free library in connection with the public schools. The United Greek Catholic church (Ruthenian rite) here was the first of that denomination in the United States. Shenandoah owes its importance to its situation among the rich anthracite coal fields. Pop., 1900, 20,321; 1910, 25,774; 1915 (U. S. est.), 28,649; 1920, 24,726.

SHENANDOAH, THE. A Confederate privateer which sailed from England to Bering Strait, captured ten New England whalers, and set fire to eight of them on June 28, 1865. This act was the last hostility of the Civil War.

SHENANDOAH RIVER. A river of northwestern Virginia, flowing 170 miles northeastward into the Potomac, which it joins at Harper's Ferry (Map: Virginia, G 2). It affords immense water power and passes through a beautiful and populous valley between the Blue Ridge and the central Appalachian ranges. This valley was the scene of numerous military operations during the Civil War. See CEDAR CREEK; EARLY; SHERIDAN; WINCHESTER.

SHENGKING. See SHINGKING.

SHEN-NUNG. See SHIN-NUNG.

SHENSHIN, shĕn′shēn, AFANASY AFANASEVITCH. See FET, A. A.

SHENSI, shĕn′sē′ (Chin., west of the defile). A province of north China, bordering on Mongolia (Map: China, J 4). Area, 75,270 square miles. It is divisible into two physically distinct regions of unequal area by the Tsingling ranges, with peaks from 5000 to 11,000 feet above sea level. The larger portion lies to the north of these mountains and consists of a great sloping plateau of loess of great natural fertility, draining eastward to the Hoang-ho and producing immense crops of wheat—the staple product of this region—and cotton, as well as kao-liang, pulse, millet, maize, peanuts, rape seed, and opium. Hemp and tobacco are also extensively cultivated. Agriculture is the chief industry. The chief river of the region is the Wei, a broad but shallow stream flowing from west to east along the foot of the northern range of the Tsingling Mountains into the Hoang-ho. Coal is found in several places. The southern division, which is only half the size of the northern, is mountainous and well wooded, with many deep valleys and small, but fertile, well-sheltered and well-watered plains. It is drained chiefly by the Han-kiang (q.v.). It produces cotton, tobacco, silk, and the different grains. Iron is found near the source of the Han, and the manufacture of steel of specially fine quality is extensively carried on in several places. Pop., 8,450,182. Capital, Singanfu (Sianfu) (q.v.).

SHEN'STONE, WILLIAM (1714–63). An English poet, born in Halesowen, Worcestershire. In 1732 he was enrolled at Pembroke College, Oxford, but he never took a degree. While at the university he published *Poems on Various Occasions,* containing the first version of the *Schoolmistress.* In 1741 appeared anonymously *The Judgment of Hercules,* followed the next year by the *Schoolmistress* in its complete form. Other poems were published in Dodsley's *Collections of Poems by Several Hands* (1748, 1755, 1758). In 1745 Shenstone came into possession of the estate of Leasowes, near Halesowen, where he amused himself at landscape gardening. His grounds, on which he expended the bulk of his income of £300 a year, became famed throughout England. By the *Schoolmistress* Shenstone keeps a secure, if humble, place in English

poetry. Dodsley collected Shenstone's works in verse and prose (3 vols., 1764–69). Consult: Graves (in a series of letters to Shenstone's friend, W. Seward), *Recollections of Shenstone* (London, 1788); *Poems* (ed. by Gilfillan, Edinburgh, 1854); H. A. Beers, *History of English Romanticism in the Eighteenth Century* (New York, 1899); Samuel Johnson, "Shenstone," in *Lives of the Poets*, vol. iii (ed. by G. B. Hill, Oxford, 1905).

SHE-OAK. See CASUARINA.

SHEOL, shē'ōl (Heb. *shĕ'ōl*). A Hebrew word of frequent occurrence in the Old Testament. In the Authorized Version it is rendered "the grave," "hell," or "the pit." In the Revised Version the American committee substitute the Hebrew term *sheol* for this rendering. A derivation from a root signifying "to hollow out" has been suggested. Another view connects the word with the verb *shā'al*, "to ask," and makes it signify the "place of oracles." Delitzsch and Jastrow have claimed that there is an Assyrian word *shualu* equivalent in meaning to the Hebrew *sheol*, but Bertin, Jensen, and Zimmern have shown that in the passages cited such a word does not occur. Jensen has suggested that the Assyrian *shilu*, "room," "pit," may be connected with *sheol*. But this is also doubtful. In poetical language *sheol* is used as a designation of the tomb, but in reality its signification is the general gathering place of the dead. For the different ideas current concerning it, and the development, see HADES and consult: Jastrow, in *American Journal of Semitic Languages*, vol. xiv (Chicago, 1898); Jensen, *Die Kosmologie der Babylonier* (Strassburg, 1890); Zimmern, in Schrader, *Die Keilinschriften und des alte Testament* (Berlin, 1902). See HELL.

SHEPARD, shĕp'ard, EDWARD MORSE (1850–1911). An American lawyer and political leader, born in New York City. He graduated at the College of the City of New York in 1869 and entered the law office of Ogden and Parsons, with the latter of whom he afterward formed a partnership. He took a deep interest in local politics, was appointed a civil-service commissioner, and was for some years counsel to the Rapid Transit Commission. In 1901 he was the candidate of Tammany Hall for mayor of Greater New York, but was defeated by Seth Low, the Fusion candidate. He published a number of books and pamphlets, including: *Martin Van Buren* (1888; rev. ed., 1900), in the "American Statesmen Series"; *Dishonor in American Public Life* (1882); *The Work of a Social Teacher* (1884).

SHEPARD, ELLIOTT FITCH (1833–93). An American lawyer and journalist, born at Jamestown, N. Y. He was educated at the University of the City of New York and was admitted to the bar in 1858. At the outbreak of the Civil War he formed the Fifty-first New York Volunteers, known after him as the Shepard Rifles. He himself served as aid-de-camp to Governor Morgan of New York and commanded the depot of State volunteers at Elmira. For 20 years after the war he was a leading member of the New York bar and in 1876 founded the New York State Bar Association. In 1888 he acquired control and became editor of the New York *Mail and Express*, which under his direction greatly improved.

SHEPARD, HELEN MILLER GOULD (MRS. FINLEY J. SHEPARD) (1868–). An American philanthropist, born in New York City, the eldest daughter of Jay Gould. At the commencement of the Spanish-American War she presented $100,000 to the United States government and during the war, as a member of the Women's National War Relief Association, was prominent. She gave $50,000 for military hospital supplies and at Camp Wyckoff, near Montauk Point, Long Island, did personal work in caring for soldiers. Her benefactions to New York University included the library building of the university, with its well-known Hall of Fame, and $10,000 for an engineering school. She also gave largely to Rutgers College. In 1900, at a cost of $50,000, she built and equipped the naval branch of the Brooklyn Y. M. C. A. and in 1914 gave $35,000 to the Army Y. M. C. A. at Fort Monroe, Va. She became a member of the board of the Russell Sage Foundation, of the National Board of the Y. W. C. A., and of the Women's Auxiliary International Committee of the Y. M. C. A. and was interested in various other organizations. In 1913 she was married to Finley J. Shepard, a railway official.

SHEPARD, THOMAS (1604–49). An English Puritan divine. He was born at Towcester, near Northampton, graduated M.A. at Emmanuel College, Cambridge, in 1627, and became a preacher. Twice silenced for nonconformity, he emigrated to Boston in 1635. In 1636 he became pastor of the church in Cambridge as successor of the Rev. Thomas Hooker. He had a prominent part in founding Harvard College and was also interested in missionary work among the Indians. He is said to have written 382 books and pamphlets. Among his writings are: *New England's Lamentation for Old England's Errours and Divisions* (1645); *The Sound Beleever* (1645); *Theses Sabbaticæ* (1649). An edition of his works in three volumes, with memoir by J. A. Albro, was published in Boston in 1853. His *Autobiography* was published in Alexander Young, *Chronicles of the First Planters of Massachusetts Bay* (Boston, 1846). Consult his life by A. Whyte (Edinburgh, 1909).

SHEPARD, WILLIAM (1737–1817). An American soldier, born near Boston, Mass. Entering the army at the age of 17 he served as captain under Sir Jeffrey Amherst (q.v.) at Fort William Henry and Crown Point. During the Revolution he attained the rank of colonel. Subsequently he became brigadier general of the Massachusetts militia and was conspicuous during Shays's Rebellion. He served in Congress from 1797 to 1803.

SHEPHERD, shĕp'ĕrd, FRANCIS JOHN (1851–). A Canadian physician. He was born at Como, Quebec, and was educated at McGill and Vienna universities. He was demonstrator of anatomy at McGill in 1875–83 and in 1883 became professor of anatomy. He was appointed senior surgeon of the Montreal General Hospital in 1883 and was elected president of the Canadian Medical Association in 1901 and dean of the McGill medical faculty in 1908. He contributed numerous papers to medical and surgical periodicals, was joint author of the *American Text-Book of Surgery* (1892) and of the *Retrospect of Surgery* (3 vols., 1881–94), and also edited the memorial volume of Robert Craik's *Addresses* (1907).

SHEPHERD, WILLIAM ROBERT (1871–). An American historian. He was born at Charleston, S. C., and graduated at Columbia

University in 1893, afterward studying at Berlin and Madrid universities. Joining the faculty of Columbia in 1902, he rose to be professor of history in 1912. His works, those dealing with Latin America being of especial importance, include: *History of Proprietary Government in Pennsylvania* (1896); *Battle of Harlem Heights* (1898); *The Cession of Louisiana to Spain* (1904); *Guide to the Materials for the History of the United States in Spanish Archives* (1908); *Historical Atlas* (1911); *Passing of New Amsterdam* (1912); *Central and South America* (1914); *Latin America* (1914); *The Expansion of Europe* (1915).

SHEPHERD DOG, or COLLIE. See SHEEP DOG.

SHEPHERD KINGS. See HYKSOS.

SHEPHERD OF HERMAS. See HERMAS, SHEPHERD OF.

SHEPHERD'S CALENDAR, THE. A pastoral poem by Spenser (1579) in 12 eclogues, one for each month. In the dialogues of the Shepherds, among whom Spenser appears as Colin Clout, questions of the day are discussed. Several are paraphrases of the eclogues of Clément Marot, and all show the influence of the classical pastoral poets.

SHEPHERD'S NEEDLE. See CHERVIL.

SHEPHERD'S-PURSE (*Capsella bursa-pastoris*). An annual, very variable, and troublesome weed of the family Cruciferæ, found almost throughout the world upon almost all soils and in all climates. It attains heights ranging from 3 inches to 2 feet, with more or less pinnatifid root leaves which spread closely along the ground. The flowers are white and diminutive. The pouch, from which the English name seems to be derived, is laterally compressed and somewhat heart-shaped. The plant usually begins to flower and fruit as soon as it is an inch or two in height, continuing throughout the season. It can be eradicated by clean culture. The young leaves and flower clusters are often used as pot herbs.

SHEPHERD'S WEEK, THE. Six satirical pastorals by John Gay (1714), meant to parody the insipid verse of the imitators of Vergil and Spenser. They are, however, such racy descriptions of actual country life that they have a distinct literary value.

SHEP'LEY, GEORGE FORSTER (1819–78). An American soldier and jurist, born at Saco, Me. He graduated at Dartmouth in 1837, studied law at Harvard, and practiced in Bangor. In 1844 he settled in Portland and was United States district attorney of Maine (1853–61). He entered the Civil War as colonel of the Twelfth Maine Volunteers and in February, 1862, was given command of the Third Brigade in General Butler's army. After the fall of New Orleans he was appointed its military commandant and mayor, but resigned in June to become military governor of Louisiana, holding this office until the civil government began in 1864. In 1865 he became military governor of Richmond, Va. He was United States circuit judge for the first circuit of Maine (1869–78).

SHEPPARD, shĕp'ard, EDMUND ERNEST (1855–). A Canadian journalist. He was born at South Dorchester, Ontario, and was educated at Bethany College, W. Va. After some experience in journalism in the Southern States he returned to Canada and became a member of the staff of the London *Advertiser*. He edited the St. Thomas *Journal* (1881–83), was editor in chief of the Toronto *News* (1883–87), and founded and was editor in chief of the Toronto *Saturday Night* (1887–1906). In 1887 he was an unsuccessful Labor candidate for the House of Commons. He was editor in chief and owner of the Toronto *Evening Star* in 1895–97. In the latter year he was sent on a trade mission by the Dominion government to Central and South America. In *Saturday Night* Sheppard established the first permanently successful Canadian newspaper devoted to the special emphasis of social life.

SHEPPARD, JACK (1702–24). A notorious English criminal. He was born at Stepney and was originally a carpenter, but became a highwayman in 1720. His story is given by Defoe (1724) and in a novel by Ainsworth (1839). He was hanged at Tyburn.

SHEPPARD, MORRIS (1875–). An American lawyer and legislator, born at Wheatville, Tex. He was educated at the University of Texas (A.B., 1895; LL.B., 1897) and at Yale law school (LL.M., 1898). He became widely known as an orator and rose to the highest office in the Woodmen of the World (q.v.). In 1902 he was elected as a Democrat to fill the unexpired term of his father as Representative in Congress. He served continuously until 1913, when he was elected to succeed Joseph W. Bailey (q.v.) as United States Senator. He was an ardent supporter of President Wilson.

SHEPSTONE, shĕp'ston, SIR THEOPHILUS (1817–93). A South African statesman, born at Westbury, near Bristol, England. He was headquarters interpreter on the staff of Sir Benjamin D'Urban during the Kaffir War (1835), British Resident among the native tribes of Kaffraria (1839), agent for the native tribes of Natal (1845), and captain general of the native levies (1848). After the constitution of Natal was reformed in 1856, Shepstone served as Secretary for Native Affairs until 1877. He came to have great influence over the natives, who called him father. In 1876 he was created a K.C.M.G. In 1877 Sir Theophilus proclaimed the annexation of the Transvaal and was then its administrator until 1879.

SHERATON, shĕr'â-tŏn, THOMAS (1751–1806). An English furniture designer, born at Stockton-on-Tees. He had come to London by 1790, and in 1791 published his *Cabinet-Maker and Upholsterer's Director*, with 111 engravings (2d ed., 1793; 3d ed., enlarged, 1802; Ger. trans., 1794). In 1802 and 1803 Sheraton published his *Cabinet Dictionary*, with 88 engravings; and in 1804 began the publication of *The Cabinet-Maker, Upholsterer, and General Artists' Encyclopædia*, with plates in color. His designs are much later and more rectilinear in style than those of Hepplewhite, whom he copied and adapted, and correspond rather to Directoire and Empire than to Louis XVI and Adam. Sheraton was always desperately poor, and never appears to have had a shop of his own, though bred as a cabinetmaker. Adam Black wrote of him: "He is a scholar, writes well, and, in my opinion, draws masterly; is an author, bookseller, stationer, and teacher. I believe his abilities and resources are his ruin in this respect—by attempting to do everything, he does nothing." Nevertheless, the circulation of his first book among cabinetmakers was so wide, and so much furniture was made from his designs, that it is quite as right to speak of the Sheraton style as of the Hepplewhite and of the Chippendale

styles. Consult: Frederick Litchfield, *Illustrated History of Furniture* (Boston, 1893); *The Connoisseur*, vols. xii–xiv (London, 1905–06); R. S. Clouston, *English Furniture and Furniture Makers of the 18th Century* (ib., 1906). For illustration, see FURNITURE.

SHERBROOKE, shûr'brụk. A city and the capital of Sherbrooke County, Quebec, Canada, at the junction of the St. Francis and Magog rivers and on the Boston and Maine, the Canadian Pacific, the Quebec Central, and the Grand Trunk railroads, 101 miles east of Montreal (Map: Quebec, J 6). It contains a college, two general hospitals, and has a considerable variety of manufactures. Pop., 1901, 11,765; 1911, 16,405.

SHERBROOKE, SIR JOHN COAPE (1764–1830). An English general, born in Nottinghamshire. He entered the army as an ensign in 1780, served in Nova Scotia and South Africa, assisted in the storming of Seringapatam, where he was wounded, and in 1805 attained the rank of major general. He was second in command in Wellesley's campaign of 1809, fought at the Douro, at Talavera, and elsewhere in Spain, and in 1811 was made a lieutenant general and was appointed Lieutenant Governor of Nova Scotia. In 1814 he led into Maine an expedition which captured Castine and Belfast, defeated an American force at Hampden and forced them to burn the frigate *John Adams*, took Bangor, and occupied a considerable part of eastern Maine. In 1816–18 he was Captain General and Governor in Chief of all Canada.

SHERBROOKE, VISCOUNT. See LOWE, ROBERT.

SHERE (shēr), or **SHER** (shĕr), **ALI,** ä'lē (1825–79). Ameer of Afghanistan—a younger son of Dost Mohammed (q.v.), whom he succeeded in accordance with his father's will as Ameer in 1863. The neglect to recognize him, on the part of the viceroys of India, turned him against the English. His throne was contested by his brothers and his nephew, but he overcame them all by 1869. The demand that an English Resident be admitted to Kabul brought on the Second Afghan War, in the course of which, in December, 1878, Shere Ali left his country and took refuge in Turkestan. See AFGHANISTAN.

SHERIDAN. A city and the county seat of Sheridan Co., Wyo., near the north border of the State on the Chicago, Burlington, and Quincy Railroad (Map: Wyoming, E 1). The chief institutions are the State Hospital and Carnegie Library. Sheridan is important as a live-stock centre, and there are deposits of coal in the region. The site of the city was the camp of Crook's army at the time of the Custer Massacre. The place was settled in 1882 and incorporated in 1883. Pop., 1900, 1559; 1910, 8408; 1915 (U. S. est.), 12,019.

SHER'IDAN, FRANCES (1724–66). An English novelist, the mother of Richard Brinsley Sheridan (q.v.). When 15 years old she wrote a romance entitled *Eugenia and Adelaide*, dramatized later by her daughter. Helped by Samuel Richardson (q.v.), she brought out *Memoirs of Miss Sidney Bidulph* (1761–1767). It was turned into French by the Abbé Prévost, the translator of *Pamela*. An Oriental tale called *The History of Nourjahad* (posthumous, 1767) was likewise successful and was translated into French. Mrs. Sheridan also wrote three comedies: *The Discovery* (1763); *The Dupe* (1764); *A Journey to Bath*, containing Mrs. Twyfort, prototypical of the famous Mrs. Malaprop (q.v.) of *The Rivals*. Consult Alicia Lefanu, *Memoirs of Mrs. Frances Sheridan* (London, 1824).

SHERIDAN, PHILIP HENRY (1831–88). A distinguished American soldier, born at Albany, N. Y. He graduated at West Point in 1853. He was appointed colonel of the Second Michigan Cavalry (1862) and participated with success in the operations in north Mississippi. Later he was appointed brigadier general of volunteers and given command of the Eleventh Division and the Army of the Ohio and in October, 1862, took part in the battle of Perryville. At Stone River (or Murfreesboro) he commanded a division of the Army of the Cumberland and by stubborn resistance helped to prevent a Federal rout. He became major general of volunteers early in 1863, took part against Van Dorn, and aided in the capture of Winchester, Tenn., June 27, 1863. At Chickamauga he maintained his reputation for daring and later was conspicuous in the battles around Chattanooga, where he came under the observation of Grant. In April, 1864, General Sheridan was transferred by Grant to Virginia and placed in command of the cavalry corps of the Army of the Potomac, and during the summer, besides protecting the flanks of the army and reconnoitring the enemy's position, was engaged in 18 actions, including the Wilderness, Spotsylvania, and Cold Harbor. His reputation for daring was further increased by his raid (May 9–25), when he destroyed railroad communications of the Confederates, captured Beaver Dam, and at Yellow Tavern defeated the Confederates under Gen. J. E. B. Stuart (q.v.), who was killed in the action.

In August, 1864, Sheridan was placed in command of the Army of the Shenandoah, soon constituted the Middle Military Division. With this command he defeated General Early at Opequon Creek, Fisher's Hill, and Cedar Creek (Oct. 19, 1864) and captured 5000 men and several guns. His dashing ride of 20 miles from Winchester to Cedar Creek (q.v.), to save his army, was a brilliant exploit. On September 10 he was made brigadier general in the regular army and in November promoted to be major general. An act for which Sheridan has been widely censured was his devastation of the Shenandoah valley to weaken Confederate resources. For the rest of the war he served under Grant in Virginia as a raider and destroyer of bridges, railroads, etc. He fought at Waynesboro, March 1, 1865; Dinwiddie Court House, March 31; and Five Forks, April 1, compelling Lee to evacuate Richmond and Petersburg, and displayed great military skill and courage. He was present at the surrender of Lee. In July, 1865, he received the thanks of Congress. After the war he assumed command of the Department of the Gulf and during Reconstruction was commander of the Fifth Military District (Louisiana and Texas) and was known for stern and vigorous enforcement of the Reconstruction Acts. In September, 1867, he was recalled by President Johnson. He then commanded the Department of the Missouri for 16 years. With the election of Grant to the presidency and the promotion of General Sherman to be commander of the army Sheridan was raised to the rank of lieutenant general. In 1870 he visited Europe to witness the Franco-Prussian War and later commanded military

divisions in the West and Southwest. During political disturbances in Louisiana (1875) he was sent to New Orleans to maintain order and was severe as a military ruler. Upon the retirement of Sherman in 1883 he succeeded to the chief command of the army. He died at Nonquitt, Mass., Aug. 5, 1888. Sheridan published *Personal Memoirs* (New York, 1888).

SHERIDAN, Richard Brinsley (1751–1816). A British dramatist and statesman, born in Dublin. He was the son of Thomas and Frances Sheridan (qq.v.). In 1762 he was sent to Harrow, where he remained till 1768. Having won no distinction at school, he continued his studies with more zeal under private tutors. Sheridan had fallen in love with Miss Elizabeth Linley, a professional singer. Disliking the attentions of a Major Mathews, this young and lovely person made up her mind to seek refuge in a French convent. Sheridan took ship with her as a guardian. The pair were married by a priest in a village near Calais. On returning to England Sheridan had a duel with the furious major, whose ill luck it was to have to beg for his life and afterward to publish an apology in the Bath *Chronicle*. In a second duel on July 2, 1772, Sheridan was gravely wounded. Both his father and Mr. Linley objected to the newly made union, so Sheridan was sent off to Waltham Abbey in Essex to study undisturbed. For a while he worked hard, being especially eager to master French and Italian, though he meant to be a barrister. On April 6, 1773, he was entered at the Middle Temple, and a week later he married Miss Linley with the consent of her father, but the elder Sheridan called the alliance a disgrace.

In conjunction with a friend at Harrow, Sheridan had already published a metrical translation of the epistles of Aristænetus, had written fugitive verse of his own, and a comedy called *Jupiter*, which was refused by Garrick. Settling in London with his wife, he now turned to literature for support. *The Rivals* was first performed on Jan. 17, 1775, and it failed. Carefully revised, it was again put on the stage 11 days later, and it succeeded. This fine comedy was followed by a farce called *Saint Patrick's Day, or the Scheming Lieutenant* (May 2, 1775) and the comic opera called *The Duenna* (Nov. 21, 1775), which ran for 75 nights, a popularity until then unprecedented. In 1776 Sheridan, helped by his father-in-law and a friend, bought out Garrick's share in Drury Lane Theatre and two years later the share of Willoughby Lacy, Garrick's partner. The money for these purchases was raised mainly on mortgage. On Sept. 21, 1776, Drury Lane was opened under Sheridan's management. The next year he produced an adaptation of Vanbrugh's *Relapse* under the title of *A Trip to Scarborough* (February 24), followed by his greatest comedy, *The School for Scandal* (May 8). His later plays are *The Critic* (Oct. 29, 1779) and *Pizarro* (May 24, 1799), adapted from Kotzebue (q.v.). *The Rivals* and *The School for Scandal* are among the best comedies in English since the Elizabethan age.

Sheridan's wit and attractive personality had long made him conspicuous in London society. In 1777 he was elected to the famous Literary Club of Johnson and Burke. Through the influence of Fox he began a parliamentary career in 1780. For his services to the Opposition during the first two years he was appointed Under-secretary of State for Foreign Affairs under the Rockingham ministry (1782) and Secretary to the Treasury under the coalition ministry of the Duke of Portland (1783). For his speeches against the American war the Congress of the United States wished to present him with £20,000. The gift was gracefully declined. His greatest speeches were against Warren Hastings. Sheridan sided with Fox against English interference in the French Revolution, but he opposed the Revolution when it began to interfere with the peace of England. He also met Pitt in debate against the union of England and Ireland and strenuously advocated the freedom of the press. Defeat in the election of 1812 brought his parliamentary career to an end. This was not his only misfortune. The destruction by fire of the new Drury Lane Theatre in 1809 put an end to Sheridan's main source of income, which for a while amounted to £10,000 a year. Harassed by creditors, Sheridan, though he would, could not pay. His embarrassments prevented his being returned from Stafford and caused him to be arrested for debt August, 1813. He became an inmate of a sponging house, but friends soon provided a loan of the needful sum and freed him. He died July 7, 1816, and was buried in Westminster Abbey.

Sheridan came in a period when satirical comedy could easily find something to make merry over in contemporary society. Moreover, that society was highly picturesque. An arch and dainty eighteenth-century grace permeates both *The Rivals* and *The School for Scandal;* they have an incessant sparkle of wit and elegance of style. By his own avowal Sheridan was not a happy man. Indeed he often thought life an unendurable burden, but his wit is never sour. He never showed, either in his literary work or in politics, rancor or grudges. Yet he seems to have been slandered his life long, though he refrained from replying to calumnies. Sheridan by sheer inborn goodness, if not by sound intelligence, was habitually on what Time's judgment calls the right side.

Consult the biographies by T. Moore (London, 1825); Mrs. Oliphant, in *English Men of Letters Series* (New York, 1883); Sanders, in *Great Writers Series* (London, 1891), which contains a full bibliography; Rae (ib., 1896); W. S. Sichel (2 vols., Boston, 1909); Fitzgerald, *The Lives of the Sheridans* (London, 1886); W. A. L. Bettany, *Sheridan and his Circle* (New York, 1912). Good editions of the comedies are by H. Morley (London, 1883); B. Matthews, *Rivals* and *School for Scandal* (New York, 1884); J. A. Symonds (London, 1884); and in Macmillan's Library of English Classics (London and New York, 1900). Sheridan's speeches were collected in five volumes (London, 1816) and finally *Sheridan's Plays,* "now printed as he wrote them" (ed. by W. Fraser Rae, ib., 1902).

SHERIDAN, Thomas (1719–88). A British actor and author, the father of Richard Brinsley Sheridan and husband of Frances Sheridan (qq.v.). He was born near Dublin, where he was educated at Trinity College. Having gone upon the stage in 1743, he played for a time at Drury Lane Theatre in London and was considered by some, including himself, a rival of Garrick. His management of the Dublin Theatre ended with a riot in 1754. The remainder of his life was spent largely in literary work, es-

pecially on the subject of elocution, upon which he was a well-known lecturer at the universities and elsewhere. In 1780 first appeared his *Dictionary of the English Language*, in which particular attention was given to pronunciation. Sheridan also edited the *Works of Swift* (with *Life*, 1784). Consult Matthews and Hutton, *Actors and Actresses of Great Britain and the United States* (New York, 1886), and Rae, *Richard Brinsley Sheridan: A Biography* (London, 1896).

SHERIDAN'S RIDE. A stirring poem by T. B. Read.

SHERIF, shå-rēf′ (Ar. *sharīf*, noble, from *sharafa*, to surpass). Among Mohammedans a name for all descendants of Mohammed. They are very numerous and found in all classes and callings. In the large cities there is a special officer, the *nakib al ashraf*, whose duty it is to keep a careful account of their genealogy. The men among the sherifs have the privilege of wearing a green turban, and the women a green veil. The guardian of the Kaaba is a sherif appointed nominally by the Sultan; he acts as Governor of Mecca with the title of Sherif of Mecca.

SHER'IFF (AS. *scirgerēfa*, shire reeve, from *scir*, district, county, jurisdiction, business + *gerēfa*, reeve). The chief executive officer of a county, who at times exercises judicial functions also. Notwithstanding his Latin title of *vice comes*, he was never a deputy earl. At the opening of English legal history he appears as "the governor of the shire, the captain of its forces, the president of its court; a distinctly royal officer, appointed by the King, dismissible at a moment's notice, strictly accountable to the Exchequer." The office was not hereditary at common law, although it became so in a few counties. During the thirteenth century it was made elective, but in 1314 Parliament changed it to an appointive office, and the method of appointment prescribed by that statute (9 Ed. III, c. 2) has been continued with few changes to the present time. (See Sheriff's Act, 1887, 50 and 51 Vict., c. 55.)

Originally the sheriff in England, as in Scotland, exercised extensive judicial authority. He presided over the common-law county court. Twice a year he made a circuit of the subdivisions of his shire for a view of frank pledge, presentment of criminal offenses, and to collect fines for petty crimes. At present his judicial functions are comparatively small.

The principal duties of the modern sheriff in England and in the United States relate to the execution (q.v.) of civil and criminal process. Thus it is the duty of the sheriff to seize property when a warrant of attachment (q.v.) has issued and seize and sell the property of a judgment debtor in satisfaction of the judgment. In populous counties he has many deputies, for whose misconduct he is civilly responsible and who give bonds to him for the proper performance of their duties. In such counties the office is a lucrative one, owing to the fact that the compensation is measured not by a fixed salary, but by the fees collected. While a few States continue the practice of appointing sheriffs, most of them have made the office elective, and many prohibit an immediate reëlection. The Federal officer corresponding to sheriff is the United States marshal. Consult: Crocker, *Duties of Sheriffs, Coroners, and Constables* (New York, 1890); Murfee, *Treatise on the Law of Sheriffs and Other Ministerial Officers* (St. Louis, 1890); Pollock and Maitland, *History of English Law* (2d ed., Cambridge and Boston, 1899); Mather, *Compendium of Sheriff and Executive Law* (London, 1903).

SHERIFFMUIR, shĕr′if-mūr′. A moor of Perthshire, Scotland, 2 miles northeast of Dunblane, famous for the indecisive battle on Nov. 13, 1715, between 9000 Jacobites under the Earl of Mar and 3500 Hanoverian troops under the Duke of Argyll. The action checked the march of the Scottish Jacobites into England. Consult *The Battle of Sheriffmuir*, "by an F. S. A." (Stirling, 1898).

SHERIFF'S COURT. A Scottish tribunal, corresponding to the county court of England and of the United States, named from its presiding magistrate, the sheriff (q.v.), whose judicial functions in Scotland have increased during modern times. Until 1748 the office of sheriff was hereditary in Scotland, but with the suppression of the Jacobite rising it was made appointive, and its judicial duties are now performed by the sheriff depute and the sheriff substitute, both being appointed by the crown, and their salaries a charge upon the civil establishment. The former must be an advocate of three years' standing, the latter an advocate or solicitor of five years' standing, and both hold office during life or good behavior.

Most civil cases of first instance in this court are heard by the sheriff substitute, who resides permanently in the county of his appointment. From his decisions appeal lies either to the sheriff depute or Court of Session. Preliminary investigations and summary criminal proceedings are generally brought before the sheriff substitute, while all criminal causes remitted by the counsel for the crown to the Sheriff's Court for trial by jury are heard by the sheriff depute. In such cases appeal lies to the Court of Justiciary. The civil jurisdiction of the Sheriff's Court extends to personal actions upon obligations without limit as to amount; to actions for the recovery of real estate, limited in the case of heritable estates to the value of £1000; to questions of servitude, nuisance, and various other matters. Consult Wilson, *Practice of the Sheriff's Courts of Scotland* (Edinburgh, 1890).

SHERLEY, Sir Anthony. See Shirley, Sir Anthony.

SHER'LOCK, Thomas (1678–1761). An English prelate, born in London and educated at Eton and at St. Catharine's Hall, Cambridge, where he took the degree of M.A. in 1701. In 1704 he obtained the mastership of the Temple, in 1714 he became master of his college and in 1715 dean of Chichester. He was raised to the see of Bangor in 1728, transferred to that of Salisbury in 1734 and to that of London in 1748. Sherlock was a strenuous Tory and supported the church and state politics of his day. He wrote much against the Deists. (See Deism.) His works, with *Life* by T. S. Hughes, were published in five volumes in London (1830). The most famous is the *Tryal of the Witnesses of the Resurrection of Jesus* (1729; 15th ed., 1794; American reprint by Presbyterian Board, Philadelphia). Consult Sir Leslie Stephen, *History of English Thought in the Eighteenth Century* (3d ed., 2 vols., New York, 1902).

SHERMAN, shĕr′man. A city and the county seat of Grayson Co., Tex., 64 miles north

of Dallas, on the Texas and Pacific, the Houston and Texas Central, the St. Louis and San Francisco, the Missouri, Kansas, and Texas, the Missouri, Oklahoma, and Gulf, and the St. Louis Southwestern railroads (Map: Texas, D 3). It is the seat of the Carr-Carlton Christian College for women, the North Texas Female College (Methodist), opened in 1877, and Austin College (Presbyterian), opened in 1850, and has a Carnegie library and fine Federal and Y. M. C. A. buildings. Sherman is the centre of a cotton-growing, stock-raising, and farming region and has cottonseed-oil mills, a cotton compress, ginneries, flouring mills, iron foundries and machine shops, brickyards, overall, candy, and cigar factories, planing mills, and a carriage manufactory. The commission form of government was adopted in 1915. Pop., 1900, 10,243; 1910, 12,412; 1915, 13,488; 1920, 15,031.

SHERMAN, Frank Dempster (1860–1916). An American educator and writer of light verse, born at Peekskill, N. Y. He graduated in 1884 from the School of Architecture of Columbia University, where he rose from assistant to be professor of graphics (1904). Sherman was honored by membership in the National Institute of Arts and Letters. He was author of *Madrigals and Catches* (1887); *New Waggings of Old Tales* (1888), with John Kendrick Bangs; *Lyrics for a Lute* (1890); *Little-Folk Lyrics* (1892); *Lyrics of Joy* (1904); *A Southern Flight* (1906), with Clinton Scollard.

SHERMAN, Henry Clapp (1875–). An American chemist, born in Ashgrove, Va. He graduated from Maryland Agricultural College in 1893, taught there for two years, took the degree of Ph.D. at Columbia University in 1897, and made nutrition investigations for the United States Department of Agriculture in 1898–99. At Columbia he held various positions, becoming professor of organic analysis in 1907. From 1909 he was head of the department of nutrition and food economy in Teachers College. During 1906–09 he was managing editor of the *School of Mines Quarterly.* In addition to many papers on chemistry and nutrition he published: *Chemistry of Food and Nutrition* (1911); *Methods of Organic Analysis* (1905; 2d ed., 1912); *Food Products* (1914).

SHERMAN, James Schoolcraft (1855–1912). A vice president of the United States. He was born at Utica, N. Y., and graduated at Hamilton College in 1878. He studied law, was admitted to the bar in 1880, and practised his profession in Utica. Entering politics as a Republican, he was active in local party affairs and was elected chairman of the Oneida Republican County Committee. He was mayor of Utica (1884–85) and was a member of Congress (1887–91, 1893–1909). He was elected chairman of Republican State conventions in 1895, 1900, and 1908, chairman of the Republican National Congressional Committee in 1906, and was elected Vice President of the United States in 1908 as the running mate of President Taft. He was president of the Utica Trust and Deposit Company and a trustee of Hamilton College, where, after his death, a chair of political science was established in his memory.

SHERMAN, John (1823–1900). An American statesman, born at Lancaster, Ohio. He was admitted to the bar in 1844 and settled at Mansfield, Ohio. He was a member of Congress (1855–77), first in the House and after 1861 in the Senate. His familiarity with public affairs made him an influential member from the first. He took a prominent part in securing the passage of the Morrill Tariff Act of 1860. Sherman was made chairman of the Ways and Means Committee of the House in 1859 and did much constructive work in finance. In the Senate he was chairman of the Finance Committee and conspicuous in the advocacy of the issue of legal-tender currency during the Civil War and of the bill to establish a national banking system. He was the author of the Refunding Act of 1870 and carried through the resolution announcing the purpose of the government to resume the payment of its obligations in specie at an early date. In 1877 he retired from the Senate to become Secretary of the Treasury under President Hayes. He succeeded in accumulating a redemption fund in the Treasury and kept the government's promise to resume specie payments Jan. 1, 1879. In 1881 Sherman returned to the Senate, where he served until 1897. In 1880, 1884, and 1888 he was a candidate for the Republican presidential nomination. He was the author of the important Statute of 1890 known as the Sherman Silver Law, providing for the monthly purchase of silver bullion by the government and the issuing of Treasury notes based upon it. He was responsible also for the notable act of the same year known as the Sherman Antitrust Law (q.v.), forbidding combinations in restraint of trade or commerce among the States. In 1897 he resigned from the Senate to become Secretary of State in the cabinet of President McKinley. On account of advanced age and infirmities he resigned shortly after the outbreak of the war with Spain in 1898 and retired to private life. He died on Oct. 22, 1900. Consult: Bronson, *Life and Public Services of John Sherman* (Columbus, 1880); Senator Sherman's *Reminiscences* (New York, 1895); his *Life* by T. E. Burton (1906). Some of his correspondence with his brother Gen. W. T. Sherman was edited by R. S. Thorndike in a volume published in New York in 1896. Consult Fleming, *General W. T. Sherman as College President* (Cleveland, 1914).

SHERMAN, Lawrence Yates (1858–). An American lawyer and legislator, born in Miami Co., Ohio. He graduated in law from McKendree College (Illinois) in 1882, was judge of McDonough County 1886–90, and from 1897 to 1905 was a Republican member of the Illinois Assembly and a leader of his party, being Speaker from 1899 to 1903. From 1905 to 1909 he served as Lieutenant Governor. Afterward for four years he was president of the State Board of Charities. Elected United States Senator in 1913 for the unexpired term of William Lorimer (q.v.), Sherman was reëlected by the people in 1914 for a full term. He soon made a prominent place for himself in the Senate.

SHERMAN, Roger (1721–93). An American patriot, a signer of the Declaration of Independence, born in Newton, Mass. He was a shoemaker in early life, removed to New Milford, Conn. (1743), became county surveyor of lands (1745), after 1750 engaged in business, studied law, and in 1754 was admitted to the bar. He then became member of the Connecticut Legislature, justice of the peace, judge of the Common Pleas, and treasurer of Yale College. In 1766 he was appointed judge of the Connecticut Superior Court and the same year was

elected to the Connecticut Senate, holding the former office for 23 years and in the latter for 19. He was an active member of the Continental and Confederation congresses (1774–87) and served on the Committee of Five appointed to prepare a draft of the Declaration of Independence. He was also a member of the committee which drafted the Articles of Confederation. From 1784 until his death he was mayor of New Haven, to which place he removed in 1761. While holding this office he was an active and influential member of the Constitutional Convention at Philadelphia in 1787, taking a conspicuous part in the debates. He was influential in his State's ratification of the Federal Constitution and became one of the first Representatives in the Federal Congress from Connecticut, but in 1791 was transferred by appointment to the Senate, in which body he served until his death. Consult Boutelle, *Life of Roger Sherman* (Chicago, 1896).

SHERMAN, Thomas West (1813–79). An American soldier, born at Newport, R. I. He graduated at West Point in 1836 and was second lieutenant in the Seminole War. He was captain in 1846, served under General Taylor in the Mexican War, and was brevetted major for gallant conduct at the battle of Buena Vista. In the Civil War he became lieutenant colonel of the Fifth Artillery and afterward was commissioned brigadier general of volunteers. He commanded the land forces against Port Royal in the winter of 1861–62, commanded a division under General Banks at Port Hudson in 1863, where he lost a leg, and until the close of the war commanded a reserve brigade of artillery and Forts Jackson and St. Philip at New Orleans. On June 1, 1863, he became colonel of the Third Artillery and on March 13, 1865, was brevetted brigadier general in the regular army for gallantry at Port Hudson and major general in both volunteer and regular armies for service throughout the war. In 1870 he was placed on the retired list with the full rank of major general.

SHERMAN, William Tecumseh (1820–91). A distinguished American soldier, born at Lancaster, Ohio, on Feb. 8, 1820. He graduated at West Point in 1840 and afterward was stationed in the South, devoting his spare moments to the study of law. Upon the outbreak of the war with Mexico he was sent by sea to California, where he served as acting assistant adjutant general. Returning East in 1850, he was appointed captain in the Commissary Department, stationed at St. Louis and later at New Orleans. In September, 1853, he resigned from the army and engaged in banking in San Francisco, remaining until 1857. He engaged in business for a brief period in New York, in 1859 began the practice of law at Leavenworth, Kans., in 1860 was superintendent of a military academy in Louisiana, and at the beginning of the Civil War president of a street railway company in St. Louis. In May, 1861, he reëntered the army as colonel of the Thirteenth Infantry and in a few weeks was appointed brigadier general. His first active service was in the first battle of Bull Run, where his brigade lost heavily. In August, 1861, he was detached from the Army of the Potomac and sent to take command in Kentucky under Gen. Robert Anderson. Sherman succeeded him in full command on October 17. He was criticized for a declaration that 200,000 men were required in the West and was relieved of his command by Buell in November and ordered to report to Halleck, then commanding the Department of Missouri. After brief service at St. Louis he was in February, 1862, assigned to the Army of the Tennessee and in April took a conspicuous part in the battle of Shiloh, being severely wounded. General Grant said officially: "To his individual efforts I am indebted for the success of that battle." He was commissioned major general of volunteers and rendered distinguished service in the operations against Corinth. In July he was sent by Grant to take command at Memphis, then just taken by Federal forces, and later began his campaign against Vicksburg. In trying to reach Vicksburg he was defeated and driven back at Chickasaw Bayou, but rendered important service which contributed to the capture of the city. In July, 1863, he was made a brigadier general in the regular army. His command was now transferred to Tennessee, where he took an active part in the operations under General Grant which ended in the battles around Chattanooga (November), immediately after which he forced Longstreet to raise the siege of Knoxville. In January, 1864, he returned to Mississippi and soon thereafter made his famous raid across the State from Jackson to Meridian and back, destroying railroads, Confederate stores, and other property. When Grant was appointed commander in chief of the armies of the United States he assigned Sherman to command the Military Division of the Mississippi, embracing the Ohio, Tennessee, Cumberland, and Arkansas departments, with temporary headquarters at Nashville and with instructions to undertake the capture of Atlanta.

In May, 1864, his army, about 100,000, set out from Chattanooga for the invasion of Georgia. The Confederates under Johnston were engaged with Sherman's army at Dalton, Resaca, Cassville, Dallas, and Kenesaw Mountain, but were compelled to retreat before his advance. Finally Atlanta was attacked, and after a siege of 40 days, marked by several sharp battles, the city was evacuated on September 1. Gen. John B. Hood, who had superseded General Johnston in command, now moved back to Tennessee, leaving the way open for Sherman's advance through Georgia to the sea. In November Sherman set out for Savannah with his army stretched out at times for a length of 60 miles. The country along the line of march was almost devastated. By December 13 he had reached Savannah, which surrendered on December 21. Already on August 12 he had been appointed major general in the regular army and now received the thanks of Congress for his "triumphal march." In February he resumed his march, turning northward through South Carolina. On Feb. 17, 1865, his army entered Columbia, and on the same day the Confederates evacuated Charleston, which was occupied on the following day by the Federals. He then pushed northward into North Carolina, Gen. Joseph E. Johnston attempting ineffectually to check him. Johnston's spirited attack at Bentonville on March 19 was repulsed, and a few days later Sherman and Schofield effected a junction at Goldsboro. On April 18 Sherman received the surrender of General Johnston at Durham's Station, but the terms of surrender were regarded by the government as too lenient and as including matters other than military.

A week later the same terms were made as those granted Lee. From the close of the war until March, 1869, Sherman commanded the Military Division of the Mississippi, with headquarters at St. Louis. Upon the appointment of Grant as full general in July, 1866, Sherman was promoted to be lieutenant general, and when Grant became President of the United States, March 4, 1869, Sherman succeeded him as general. He retired from the army on full pay in February, 1884, and died in New York on Feb. 14, 1891. His *Memoirs* were published in 1875 (2 vols., New York). His correspondence with his brother, Senator John Sherman, appeared in 1894 (New York). Short biographies have been written by Force (New York, 1899) and Robins (Philadelphia, 1905). In 1903 an equestrian statue of the great commander, the work of Saint-Gaudens, was unveiled in Central Park, New York, and a fine equestrian statue was set up in Washington, D. C. Consult Gamaliel Bradford, *Union Portraits* (Boston, 1916).

SHERMAN ANTITRUST LAW. An Act approved July 2, 1890, declaring illegal "every contract, combination in the form of trust or otherwise, in restraint of trade or commerce among the several States, or with foreign nations." Criminal penalties are prescribed in the Act for any person or persons found guilty of entering into contracts or combinations of the character proscribed. The Act also gives to persons injured by such unlawful acts right to sue in the United States courts and to recover threefold damages. In certain details, relating to procedure and penalties, the law has been amended, and its scope has been alternately restricted and extended by judicial decisions. In its essentials it remains the fundamental law of the United States on the subject of combinations. See TRUSTS.

SHERWOOD, shēr'wụd, HENRY (c.1801–58). A Canadian statesman. He was born at Toronto, was educated at Upper Canada College, and was called to the bar. Entering politics as a Conservative, he represented Toronto in the Canada Legislative Assembly in 1841–54. He was Solicitor-General for Upper Canada in the first Lafontaine-Baldwin ministry in 1842 and again Solicitor-General (1844–46) in the ministry of William Henry Draper (q.v.). Many objections, especially among reformers, were made against the presence of Sherwood in the first Lafontaine-Baldwin administration; nor was he at home in the ministry of Draper, as the latter, though a Conservative, was inclined to compromise. After Draper's retirement in 1847 Sherwood succeeded him as Premier. He also became Attorney-General for Upper Canada. His party, however, was at this time disintegrating, the more progressive Conservatives being led by Mr. (afterward Sir) John A. Macdonald. Sherwood was unable to cope with the difficulties of his situation, and his administration was defeated in 1848. In conjunction with Sir Allan MacNab he led the Conservative Opposition after the formation, in 1848, of the second Lafontaine-Baldwin ministry.

SHERWOOD, MARY MARTHA (1775–1851). An English author, eldest daughter of George Butt, chaplain to George III, born at Stanford, Worcestershire. Her books, numbering nearly 100, comprise mostly tracts and short stories with a strong religious flavor. Many children of the English middle class of the period were brought up on *The History of the Fairchild Family, a collection of stories calculated to show the Importance and Effect of a religious Education* (part i, 1818; part ii, 1842; part iii, 1847). Extremely popular were *Susan Gray* and *Little Henry and his Bearer.* Several of her stories were translated into many languages. Consult *Works* (New York, 1855); Mrs. S. Kelly, *Life* (London, 1854).

SHERWOOD, ROSINA (EMMET) (1854–). An American artist, born in New York City. She studied under William Chase and afterward in Paris under Julien. She first became known as an illustrator, and then as a painter, both in oil and water colors. She was awarded medals at Chicago (1893), Buffalo (1901), and St. Louis (1904), and was elected an Associate of the National Academy.

SHERWOOD, WILLIAM HALL (1854–1911). An American pianist and teacher, born at Lyons, N. Y. He studied with William Mason and then for five years in Europe under Kullak, Weitzmann, and Liszt. For several years he was teacher of the piano at the New England Conservatory, after which he went to New York and in 1889 made Chicago his home. He became head of the piano faculty of the Chicago Conservatory, resigning that position in 1897 to establish the Sherwood Piano School. He died in Chicago.

SHERWOOD FOREST. A stretch of hilly country in the west of Nottinghamshire, England, between Nottingham and Worksop, about 25 miles from north to south and 6 to 8 miles from east to west. It was formerly a royal hunting forest and the traditional scene of many of the exploits of Robin Hood and his followers. It is now almost wholly denuded and is occupied by gentlemen's seats, parks, and farms. The town of Mansfield and a number of villages are situated within the ancient bounds. Consult White, *Nottinghamshire and Sherwood Forest* (Worksop, 1875).

SHERWOOD OIL. See PETROLEUM.

SHE STOOPS TO CONQUER. A comedy by Oliver Goldsmith, among the three or four plays of the period which still hold the stage. It was first performed at Covent Garden in 1773, with immediate success.

SHETLAND (or ZETLAND) ISLANDS (anciently *Hjaltland*). A group of about 100 islands, lying between the Atlantic Ocean and the North Sea, about 50 miles northeast of the Orkney Islands and 210 miles west of Norway (Map: Scotland, F 1). They constitute a county of Scotland. The total area is stated at 352,319 acres, or about 350 square miles. Pop., 1801, 22,379; 1901, 28,166; 1911, 27,911; the largest recorded population is 31,670, in 1861. The largest island is Mainland, or Shetland, embracing about half the entire area (pop., 1911, 19,607). About 25 of the other islands are inhabited, including Yell (pop., 1911, 2348), Unst (2066), Whalsay (1042), Bressay (635), Fetlar (279), Papa-Stour (212), East Burra (185), and Foula (184). Lerwick (q.v.), in Mainland, is the chief town. The surface is rugged and wild; the coasts are abrupt and indented with deep bays, or voes. The rocks are mainly gneiss, clay slate, sandstone, and granite. The highest point is Ronas Hill, in Mainland, 1475 feet. The climate is moist and variable. Fishing for cod, ling, and herring is the chief industry; seals and bottle-nosed whales are often caught. Much attention is given to the rearing of cattle,

sheep, and ponies, the little Shetland ponies being famous. Almost all the small tenants practice spade cultivation. Oats and barley are the only grain crops; potatoes and turnips are grown. The manufactures are chiefly hosiery and shawls, and the exports, besides these, are cattle, fish, and eggs; the chief imports are oatmeal, flour, tea, tobacco, spirits, sugar, cottons, woolens, timber (chiefly from Norway), tar, salt, etc.

Though little is known of the original inhabitants of Shetland, the physiognomy, character, and language point to a Norse or Scandinavian origin. In Unst cairns have been found over long and short stone coffins, with skeletons, clay urns, weapons, and stone vessels. Tumuli are frequent and contain remains of rude buildings and stone implements. Circular strongholds of unhewn stone, called burghs or broughs, are very numerous, generally on a cliff or headland, but also on artificial islands in fresh-water lochs. Mouse Isle has the most perfect brough known. Consult Hibbert, *The Shetland Islands* (new ed., Edinburgh, 1892), and Edmund Selous, *A Bird Watcher in the Shetlands* (New York, 1905).

SHETLAND PONY, or SHELTIE. See PONY.

SHEV'TCHENKO, TARAS GRIGORYEVITCH (1814–61). The greatest poet of Little Russia (Ukrainia). Born in serfdom in the Government of Kiev, he was, upon his own urgent request, apprenticed to a house decorator, whom he accompanied to St. Petersburg in 1833. Some young writers took a great interest in him and helped him in his struggle for an education. He became the pupil and comrade of Briulov at the Academy of Design, from which he graduated in 1843. In 1840 he published a collection of poems under the title of *Kobzár;* it was followed by *Naymitchka* (The Hired Girl), *Nevolnik* (Prisoner), *Ivan Huss,* and an epic *Haidamaki.* In 1847 he was arrested for political reasons and sent to Orenburg as a private soldier. Pardoned after 10 years, he was permitted to settle in the capital in 1858. His complete works were published at Prague (2 vols., 1876), with biographical notices, one by Turgenev, and at Lemberg (1893). Consult: Obrist, *T. G. Szewczenko: ein kleinrussischer Dichter* (Czernowitz, 1870); *Westminster Review* (London, July, 1880); the German translation of his selected lyrics by Szpoynarowski (Czernowitz, 1904–06); the *Six Lyrics* (trans. by Voynich, London, 1911); *Literaturno-Naukovi Vistnik,* vol. lxv (Kiev, 1914).

SHEWBREAD, shō'brĕd'. An expression used in the English Bible for the 12 loaves which, according to the Pentateuchal codes, were placed on a table of acacia wood in the holy place. They were made of fine flour, unleavened, and sprinkled with frankincense; they were arranged in two rows of six loaves each, and the bread was changed every Sabbath; when the change was made, frankincense was burned and the old bread was given to the priests to be eaten in the holy place. (Ex. xxv. 23–30; Lev. xxiv. 5–9; Josephus, *Ant.,* iii, 10, 7.) The term "shewbread" was used by Tyndale in his translation of the New Testament. (Heb. ix. 5.) The Hebrew name means "bread of the presence." Other expressions are used, such as holy bread (1 Sam. xxi. 6) and pile bread (1 Chron. ix. 32). The former passage, where the shewbread of the sanctuary at Nob in the days of David is referred to, indicates the antiquity of the rite. Similar rites are found among various nations of antiquity. There is a Babylonian phrase which is identical with the Hebrew (cf. Zimmern, *Beiträge zur Kenntnis der babylonischen Religion,* Leipzig, 1896–1900), and references are found in Babylonian literature to the piling up of loaves on a table set before a divinity, the number of such loaves being 12, 24, or 36. The inclusion of the rite in the later regulations of the Jewish cult is an instance of survival, though naturally an interpretation was given in accordance with more advanced ideas. Great care was bestowed upon the preparation of the shewbread. According to the Talmud the flour must be sifted 11 times, and the kneading and baking were intrusted to a special priestly family in whose hands the privileges generally remained for several generations. Consult Benzinger, *Hebräische Archäologie* (2d ed., Tübingen, 1907).

SHIAHS, shē'ăz. See SHIITES.

SHIB'BOLETH (Heb., ear of corn, stream). The test word used by the Gileadites under Jephthah after their victory over the Ephraimites, recorded in Judg. xii. 6. It appears that the latter could not pronounce the *sh* and, by saying *sibboleth,* betrayed themselves and were slaughtered mercilessly. It may be noticed that all those Hebrew names in the Old Testament which begin with the *sh* have now, through the inability of the translators to render this sound in Greek, become familiar to us as beginning with the simple *s,* e.g., Simon, Samaria, Solomon, Saul, etc. The word "shibboleth" is used in modern languages in the sense indicated, viz., a test of speech, doctrines, and manners of a certain party or class of society.

SHIBUSAWA, shē'bōō-sä'wȧ, EI-ICHI, BARON (1840–). A Japanese banker and capitalist, born in Saitama prefecture. He took service under the Tokugawa Shogunate, visited Europe in 1867–68, and was connected with the Treasury Department of the newly established Imperial government in 1869–73. In the latter year he founded the first national bank of Japan, known as the First Bank, and in time he came to be supreme in the commercial, financial, and industrial circles of Japan. He established a commercial training school, led in the formation in 1878 of the Tokyo Chamber of Commerce, of which he was chairman until 1905, and was instrumental in founding the Tokyo Almshouse, of which he was director after 1889. His public services gained him elevation to the Japanese peerage. He visited the United States in 1902, 1909, and 1915.

SHICHI-TO, shē'chē'tō' (Jap., Seven Islands). A group of small islands southeast of the peninsula of Idzu, central Hondo, Japan (Map: Japan, F 6). The most important member of the group is called Vries Island by foreigners and Oshima (large island) by the Japanese. Its centre is an active volcano. The other islands are Toshima, Nishima, Shikineshima, Kodzushima, Miyakeshima, and Mikurashima. The islands were used as convict settlements until the end of the eighteenth century.

SHIDZUOKA, shēd'zu-ō'kȧ. The capital of the prefecture of the same name in Japan, near the southern coast of Hondo, 120 miles by rail southwest of Tokyo (Map: Japan, F 6). It is a well-built industrial town with manufactures of lacquer ware and basketwork. In the vicinity is produced one of the best kinds of tea found in Japan. The Buddhist temple of Rinzaiji, a short distance from the city, is noted

principally on account of its association with the Shogun Iyeyasu (1542–1616), the first Shogun of the Tokugawa family, who resided at Shidzuoka until 1590. The temple of Sengen is surrounded by beautiful grounds, which now serve as a public park, and is especially known for its fine specimens of wood carving. The town is also associated with the last Shogun of Japan, who retired to Shidzuoka after the overthrow of the shogunate in 1868 and resided there until 1897. Pop., 1908, 53,618.

SHIELD (AS. *scild*, shield). A piece of defensive armor borne on the left arm or in the hand to ward off the strokes of the sword and of missiles. The large shield worn by the Greek hoplites was circular or oval and often ornamented with devices. The shield (Lat. *scutum*) used by the Roman heavy-armed infantry was quadrangular and bent to encircle the body in part. The shields were built so strongly as to afford protection against heavy missiles from the walls of a besieged city. (See TESTUDO.) The Romans also had a lighter form of shield known as the *clipeus*. Among the Germanic peoples the shield was the warrior's chief insignia of honor, and to be lifted on the shield by the warriors of the tribe was to be made leader in war or king. In the early Middle Ages the shield was most important for both horsemen and foot soldiers. Its form was usually round and bent, with a boss of metal in the form of a hollow button or spike in the centre of the convex surface. Across the hollow of the boss was placed a handle of wood covered with iron. If the shield was held at arm's length, it was called a buckler; if it was swung over the arm, it was known as a target. The body of the shield was made of limewood, though leather was sometimes used. The shields of the northern peoples were fancifully decorated, and as Christianity spread the cross became a common decoration. The heraldic device appears after the age of the Bayeux tapestry. With the form and visage of men totally concealed under suits of armor, the device on the shield was in fact the only means of distinguishing in the heat of battle between friend and foe. (See HERALDRY.) In the eleventh century the kite-shaped shield was much used, and many shields of this form are found on the Bayeux tapestry. By the middle of the twelfth century the triangular shield was much in vogue. It was customary at this period and later to make the shield the dead knight's bier. In the thirteenth century the custom was introduced of hanging shields in churches. Pear-shaped, heart-shaped, and quadrangular shields were used in this period, and the shield was much smaller. In the fourteenth century we have mention of large shields carried by the foot soldiers. In the fifteenth century the small buckler was used by the foot soldiers, although large wicker shields were still in use. Even as late as the seventeenth century the target was used effectively by the soldiers of Maurice of Nassau. Consult: Charles Boutell, *Arms and Armour* (New York, 1874); Auguste Demmin, *An Illustrated History of Arms and Armour* (Eng. trans., London, 1877); J. G. Gardner, *Armour in England* (ib., 1897); C. H. Ashdown, *Arms and Armour* (New York, 1909). See ARMOR.

SHIELD BEETLE. See TORTOISE BEETLE.

SHIELD OF HERACLES. A Hesiodic poem of uncertain date and authorship, though almost certainly not the work of Hesiod. It describes, in 480 lines, a struggle at Pagasæ between Heracles and Cycnus, the son of Aves, and contains a long description of the hero's shield, in imitation of the similar picture of the shield of Achilles in the *Iliad*.

SHIELDRAKE. See SHELDRAKE.

SHIELDS, CHARLES WOODRUFF (1825–1904). An American theologian. He was born at New Albany, Ind., graduated at the College of New Jersey (later Princeton) in 1844 and at Princeton Theological Seminary in 1847. After holding two pastorates he returned (1866) to Princeton College as professor of the harmony of science and revealed religion. In 1898 he took orders in the Episcopal church, but retained his chair at Princeton till his death. He published: *The Book of Common Prayer as Amended by the Presbyterian Divines of 1661* (1864; 2d ed., 1883); *The Order of the Sciences* (1882); *Philosophia Ultima* (3 vols., 1888–1905), with a memoir by W. M. Sloane; *The Scientific Evidences of Revealed Religion* (1900), Paddock lectures.

SHIELDS, JAMES (1810–79). An American soldier and political leader, born at Dungannon, County Tyrone, Ireland. He emigrated to the United States in 1826 and in 1832 began the practice of law at Kaskaskia, Ill. Shields was in the Mexican War as a brigadier general and was brevetted major general for gallantry at Cerro Gordo. He was appointed Governor of Oregon Territory (1848), but resigned the next year to accept an election from the Democrats as United States Senator from Illinois. In 1855 he removed to Minnesota and (1858) was elected Senator from that State, but in 1859 went to California. In the Civil War he was commissioned brigadier general of volunteers and in March, 1862, succeeded to the command of General Lander's division. He was in command at Winchester (March 23), where he was severely wounded, and at Port Republic (June 9), where he was defeated by Stonewall Jackson. In March, 1863, he resigned from the army and soon after settled at Carrollton, Mo. He was appointed United States Senator from Missouri in 1879 to fill an unexpired term.

SHIELDS, JOHN KNIGHT (1858–). An American legislator. He was born at Clinchdale, Tenn., and was admitted to the bar in 1879. In 1892–94 he was chancellor of the twelfth chancery division of Tennessee and was associate justice (1902–10) and Chief Justice (1910–13) of the Supreme Court of Tennessee. He served as delegate to the Democratic National Convention in 1896 and again in 1904. In 1913 Shields was elected United States Senator.

SHIELDS, SOUTH and NORTH. Two seaport towns in Durham and Northumberland, England, at the mouth of the Tyne, on opposite banks of the river, 8 miles east-northeast of Newcastle (q.v.) (Map: England, E 1). Steam ferries connect the towns, which are the chief English ports for the building of iron ships of every kind and for all supplemental shipping industries. The towns possess large alkali, bottle, and glass works. Coal and coke are exported, and timber, grain, and esparto grass largely imported. NORTH SHIELDS is included in the borough of Tynemouth (q.v.). It has two docks covering 79 acres. Pop., about 9000. SOUTH SHIELDS is a municipal, county, and parliamentary borough with a progressive administration. It has 15 docks, including the Tyne

dock of 50 acres, and a breakwater, the south pier, a mile in length. There are a large public library, a marine school, and a park of 45 acres. Founded in the thirteenth century by the convent of Durham, the progress of the town was checked by Henry III, who, on the complaints of Newcastle, ordered that no "shoars" or quays be built or ships loaded or unloaded. It was incorporated in 1850. Pop., 1901, 97,300; 1911, 108,647.

SHIELDTAIL. One of an Oriental family (Uropeltidæ) of small burrowing snakes, sometimes called earth snakes, in which the tail is obliquely truncated and covered by an oval horny plate.

SHIFTING USE. A use which arises by virtue of an express limitation in a deed or which may be created by a person named therein upon certain conditions and which is in derogation of some other estate; as, if land is conveyed in fee to the use of A and his heirs until B marries C, then to the use of B and his heirs, a shifting use is created, as it is in derogation of A's estate. The doctrine of shifting uses affords a means of limiting a "fee upon a fee," which, although not possible under the early common law, was adopted and given effect when the limitation was contained in a will which was governed by equitable rather than strict legal rules. It was thus called an executory devise. Shifting uses are not now recognized as such, but the principles governing them have been adopted into the modern law of trusts. In some States the doctrine of uses has been abolished by statute. Consult Gilbert, *Law of Uses and Trusts* (3d ed., London, 1811).

SHIH HWANG-TI. See SHE HWANG-TI.

SHIITES, shē'ĭts (from Ar. *shī'ah*, party). The sect in Islam which insists upon the sole legitimacy of Ali and his descendants as the successors of Mohammed and so are opposed to the Sunnites (q.v.). The division has its root in the different opinions and struggles concerning the successor of the Prophet. (See MOHAMMEDAN SECTS.) Ali seems to have been capable of invoking an extraordinary enthusiasm in his followers, such as even the Prophet never gained, and the personal element has since remained one of the sources of Shiite strength. Further, the tragedies of his house have given a sentimental motif to his party. The memory of the tragedy is still celebrated from year to year by the Shiite world in a kind of passion play on the tenth day of Muharram, the anniversary of Kerbela. (See HASAN AND HUSAIN.) The conservatives acknowledged Ali's caliphate and revered him as a saint and martyr, but they possessed no such legitimist principles as his adherents. A bitter struggle followed his selection as Caliph. (See OMMIADS; MOAWIYAH.) The resulting history is a remarkably complicated one, partly by reason of the interfusion of the Shiites throughout orthodox Islam and partly because the party itself soon split upon all kinds of political purposes, personal ambitions, and theological tenets. We find them in part founding new states, in part establishing mystical fraternities and schools of liberal thought, in part cherishing, more or less patiently, millennial hopes.

The root of the sect lay in the personality of Ali. Politically this involved the sole right of succession as inherent in his descendants. Here, however, various views developed according to the claims of various lines; some held that descent must pass through Fatima, the daughter of Mohammed and wife of Ali, others that any of Ali's descendants were legitimate. Further, about Ali's person arose a theology which was incongruous to original Islam and which gave room for all forms of theosophic speculation. He came to be named in the creed along with God and Mohammed as "the representative of God." Some, even in his lifetime, held him to be an incarnation of God. Others, starting from his violent death, taught that he was reserved for a future reappearance, as the Hidden Imam, or Mahdi (q.v.), who should establish the millennium; this notion was contributed to by the large numbers of Jewish and Christian converts that came into Islam. Others held that Ali was reincarnated in the imams, his legitimate descendants; this was the product of Oriental theosophy coming in through Persia and India. In general the doctrine was that God never left Himself without an authoritative representative or imam in the world and that it was the business of the faithful to find him. The strength, therefore, of the Shiites lay in the doctrine of legitimism and in the opportunity it gave to those temperaments and races which desired a richer theology than that of simple Moslem unitarianism. With the passing of Islam out of Arabian hands the development of history made the whole doctrine of a legitimacy of blood or race as a sine qua non of the ruler a pure fiction, and in its opportunities lay the strength of Sunnite orthodoxy, which was thus able to assimilate the barbarian races which conquered original Islam. As for the peculiar Shiite theologies, they antagonized in general the spirit and letter of the Koran, to which as a religion of a book Islam is necessarily bound. Thus we find Shiism perpetuating itself secretly and coming to the surface sporadically or on the periphery of Islam, but never able to gain any but a temporary control over the great Moslem body. Its history, therefore, is a story of opposition to the principles of Islam, existing in underground organizations, taking advantage of political and theological opportunities and of free-thinking rulers, now and again creating independent states through the personal ability of some Alid scion. An early instance was the establishment of the Idrisid dynasty in north Africa (800), through a great-grandson of Ali. From this connection the present sherifs of Morocco, whose dynasty has existed since the end of the eighteenth century, claim to possess the legitimate caliphate. Another branch of the family, that of the Zaydites, arose in northern Persia and in Yemen in southern Arabia; in the latter land the sect still maintains itself.

The doctrine of the Hidden Imam, or the Mahdi, soon produced innumerable divisions in the sect. Any Alid might come to be regarded as the Promised One and so gain a following. The most notable split of this kind occurred in 765, when a dispute arose between the two sons of the sixth imam, Jafar al Sadik. Through one of these the line was traced down to the twelfth in descent, Mohammed ibn al Hasan, who was supposed to have been mysteriously translated to abide his return. His followers are called the Ithnaashariya, i.e., Twelvers, and have come to be the prevailing Shiite sect and the only one now possessing an important political domain, viz., Persia, which came into their hands by conquest in 1502. But Jafar's

other son, Ismail, who was the seventh in succession, was accepted by another faction, the Ismaelites or Sabaïyites, i.e., Seveners. His cause was taken up by a machinator, Abdallah ibn Maimun (c.850), who founded the secret society which developed into the Karmathians.

A more abiding political result was produced in Africa. Said, great-grandson of al Maimun, gave himself out in the western regions of north Africa as the Mahdi and gained a political following which enabled him and his line, the Fatimid dynasty, to conquer Egypt and Syria, which they ruled for over two centuries. During the same period (932–1055) the Shiite Buwayyids were political masters of the Sunnite caliphate at Bagdad, so that Shiism appeared triumphant in the heart of Islam. But the mass of the people remained orthodox, and the Saracens finally turned the scale in their favor. From the Shiite Fatimid movement in Egypt sprang two developments, which were for many centuries disturbing factors in southwestern Asia, viz., the Druses and the Assassins (qq.v.). Also the Syrian Nosairians (q.v.) adopted some of the Shiite doctrines and are still a considerable sect.

Modern history finds the Shiites, outside of scattered sects, in political importance in the following lands: the dynasty which until 1912 held control of Morocco was Alid, although the land is practically Sunnite. In southern Arabia Yemen is Shiite, and there are other traces of the sect in other parts of the peninsula. A large number of the Indian Moslems are of the same persuasion. But Persia is now the only Shiite nation of importance. Here, however, Shiism has not been able to achieve its political ideals. The Safawid dynasty, to which the shahs belong and which conquered Persia in 1502, claims descent from Ali, but the religious authorities disown them, and there has been continuous strife between the latter and the political authorities. In any case the Shiite theology could recognize their power as but temporary until the appearance of the Hidden Imam. The ecclesiastical head is the Imam Jumaa, at Ispahan, who is regarded as the representative of the Mahdi. An interesting attempt at reform was made by Ali Mohammed, al Bab (1843), but, becoming a political agitation, it was cruelly repressed by the government. (See BABISM.) A reform movement growing out of Babism is Bahaism. See MOHAMMEDAN SECTS.

For literature, besides the works mentioned under MAHDI, MOHAMMEDANISM, MOHAMMEDAN SECTS, consult: Bailie, *Imameea Code*, vol. ii (London, 1869); Goldziher, *Beiträge zur Litteraturgeschichte der Shi'a* (Vienna, 1874); Huart, *Histoire des Arabes* (Paris, 1912).

SHIKARPUR, shĭk'är-pōōr'. A town in Sind, British India, 23 miles northwest of Sukkur (Map: India, A 3). It has a fine covered bazar, and has long been noted for its commercial interests, its situation giving it sole control of the trade carried on through the Bolan Pass. The section is chiefly engaged in farming and fruit growing, and there are manufactures of carpets, leather, pottery, and coarse cotton cloth. Pop., 1901, 49,491; 1911, 48,147.

SHIKOKU, shē'kō'kōō' (Jap., Four Provinces). The third in importance of the principal islands of the Japanese Empire (Map: Japan, C 7). Area, 7030 square miles. Its coast line is very irregular. It has no really good harbor, but a number of small ones afford safe refuge for junks and small steamers. Its surface is mountainous, so that the greater part is not cultivated. The valleys are fertile, bearing the usual grains. On the slopes of the hills the paper mulberry and the vegetable wax tree are cultivated. Camphor and tea are exported. The climate is warm in the south, so that bananas, grapefruit, and exceptionally fine oranges are grown, also a small amount of sugar cane. The island is divided administratively into four prefectures: Tokushima, Kagawa, Ehime, and Kochi. Pop., 1908, 3,288,390.

SHIL'DON AND EAST THICK'LEY. A coal-mining town in Durham, England, 3 miles southeast of Bishop Auckland. Pop., 1901, 11,760; 1911, 13,488.

SHILHAS, or SHILLUHS. See SHULLUHS.

SHILKA, shĕl'kà. A branch of the Amur River (q.v.).

SHIL'LABER, BENJAMIN PENHALLOW (1814–90). An American humorist, born at Portsmouth, N. H. From 1840 to 1847 he wrote amusing sketches and squibs under the pen name of Mrs. Partington and gained a wide reputation as a humorist. From 1856 he was for 10 years one of the editors of the Boston *Saturday Evening Gazette*. Among his successful books may be named: *Rhymes with Reason and Without* (1853); *Life and Sayings of Mrs. Partington* (1854); *Knitting-Work* (1857); *Partingtonian Patchwork* (1873); *Ike and his Friend* (1879).

SHIL'LETO, RICHARD (1809–76). An English Hellenist, born at Ulleshelf, Yorkshire. He studied at Repton and Shrewsbury Schools and at Trinity College, Cambridge. In 1867 he was elected fellow of Peterhouse. Shilleto's editions of Demosthenes, *De Falsa Legatione* (1844; 4th ed., 1874), and of the first two books of Thucydides (1872–80), as well as his polemic *Thucydides or Grote* (1851), showed him to be a critic of rare ability. Consult J. E. Sandys, *A History of Classical Scholarship*, vol. iii (Cambridge, 1908).

SHIL'LUK. A people on the White Nile, lat. 9°–12° N., numbering about 1,000,000, forming with the Dinka and Nuer the group of partly Hamitic "Nilotic Negroids." Linguistically they are of the Niloto-Sudanic subdivision of the Nilotic group, which originally belonged to the Sudanese family, but has been strongly affected by Hamitic influences. Physically they are tall (1.776 meters), long-headed (cephalic index, 71.3), dark-skinned, and woolly-haired. While the coarser types seem related to the West African negro, members of the aristocracy not infrequently display startlingly European features, with thin lips and well-modeled foreheads. Consult Diedrich Westermann, *The Shilluk, their Language and Folklore* (1912), and C. G. Seligmann, "Some Aspects of the Hamitic Problem in the Anglo-Egyptian Sudan," in *Journal of the Royal Anthropological Institute* (London, 1913).

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